RouteFinder™

Model RF500S
DSL/Cable Router
with Built-in 4-port 10/100 Switch

User Guide

MultiTech® Systems

User Guide
DSL/Cable Router
with Built-in 4-port 10/100 Switch
P/N S0000093 Revision A

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RouteFinder™

Chapter 1 - Introduction

MultiTech® Systems

Introduction

Congratulations on the purchase of the Multi-Tech System's RouteFinder model RF500S, one of the finest broadband routers available today.

The RouteFinder connects a cable or DSL modem to an Ethernet LAN to provide high-speed broadband access to the Internet for multiple users. The RouteFinder router features a built-in 4-port 10/100 switch, one asynchronous port for backup Internet access or dial-in remote access, and firewall services. This solution is ideal for any business looking for cost-effective broadband access to the Internet for every use on the LAN or for the home user looking to share their DSL cable modem.

Connects up to 253 internal IP addresses to the Internet with broadband speed. The RouteFinder can be configured as a DHCP server to handle requests for Internet services and route to and from the ISP. Up to 253 internal IP addresses are connected to the Internet with only one IP account. The WAN Ethernet port has a bandwidth of 10M bs which is 179 times faster than a 56k modem and can support DSL or cable speeds of up to 2.5M bs.

Built-in 10/100 Switch. The integrated 4-port 10/100 switch eliminates the need for an additional hub or switch to connect users not on a LAN. It ensures high-speed transmission and can serve as a completely dedicated full duplex backbone.

Network Security. The RouteFinder uses the NAT protocol to provide security from hackers attempting to access the office LAN without the extra cost of a firewall. It implements firewall and gateway security for LAN-based resources. Additionally, the RouteFinder supports Internet access restriction by IP address, client protocols or a list of forbidden sites.

Dial Backup or Dial-in RAS Port. The RouteFinder also provides an additional asynchronous port that, when connected to a dial-up modem or ISDN terminal adapter, serves as a backup resource for Internet access if your cable or DSL service goes down. It can also serve as dial-in remote access for your telecommuters or mobile users.

Virtual Server Support. In addition to providing shared Internet access, the RouteFinder can support Web, FTP or other Internet servers. Once configured, the RouteFinder accepts only unsolicited IP packets addressed to the Web or FTP server.

LAN Segmentation. For added LAN security, the RouteFinder can be used to segment the LAN by connecting the corporate servers to one RouteFinder Ethernet port and the Internet Servers to the other Ethernet port. This configuration puts the corporate servers behind a firewall and the Internet servers outside the firewall. To continue to provide Internet access, connect a modem or ISDN terminal adapter to the RouteFinder's asynchronous port.

The RouteFinder RF500S

Front Panel

RF500S Front Panel

Front Panel Description

LAN

Link/ACT	Lights when the LAN client is correctly connected to the 10 BaseT Ethernet LAN.
100	Lights when the LAN client correctly establishes a 100M bs connection.
FDX/COL	A constant light indicates a successful LAN connection. A frequently flickering light indicates a potential network connection problem.

Serial

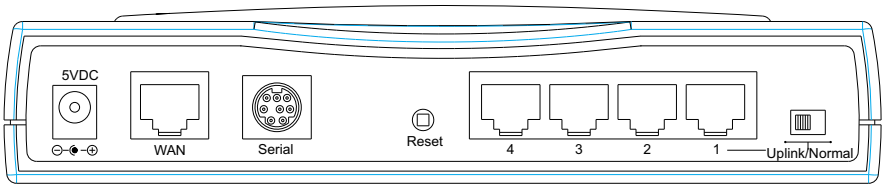
Data	Blinks when the Serial async port is receiving or transmitting data.
DCD	Lights when the Serial async port is properly connected to a remote site.

WAN

Link	Lights when a successful connection to the 10BaseT WAN is established.
RXD	Lights when the LAN port is receiving data.
TXD	Lights when the LAN port is transmitting data.

Power Lights when power is being supplied to the router.

Back Panel



RF500S Back Panel

Back Panel Description

Power 5VDC	The 5V DC Power socket is used to connect the device to the AC power adapter.
10 BT WAN	The WAN port is used to connect the router to a DSL or Cable modem.
ASYNC	The Serial async port connects the router to a standard modem (optional).
Reset	The Reset button is used to reset the router to factory defaults.
10/100 BT LAN	The 4-10/100 ports are used to connect the router to LAN client workstations. If the RF500S is set to use the Uplink feature, the number 1 LAN port is inactive as a LAN port.
Uplink/Normal	Slide the switch to the Uplink position to use the number 1 LAN 10/100 port to expand your network by connecting a network cable to another router, switch or hub. To connect the number 1 port to a LAN client workstation, slide the switch to the Normal position.

Typical Applications

The following examples provide information about typical applications using the RF500S. They describe using the RF500S to connect a remote site via a cable modem, using the RF500S to segment a local area network, and using the RF500S to connect a LAN to the Internet using one shared IP address.

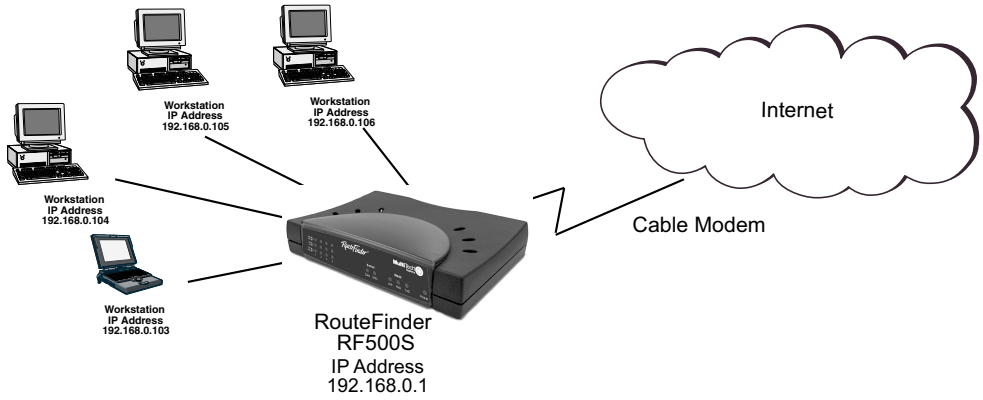
Connecting a Remote Site via Cable Modem

In the following example the RF500S is used to connect a LAN to the Internet via DSL or a cable modem.

Kernal: **NAT** (outgoing TCP/IP connection sharing a single Internet IP address or using multiple IP mapping)
- Virtual Server (allowing incoming specific TCP/IP service request redirect to an internal server)
- Static Routing (Routing table setting to Internal Local Gateways)
- Firewall

External: Fixed External Port IP or DHCP client (Dynamic IP assigned)

Internal: Device Fixed IP
DHCP Server

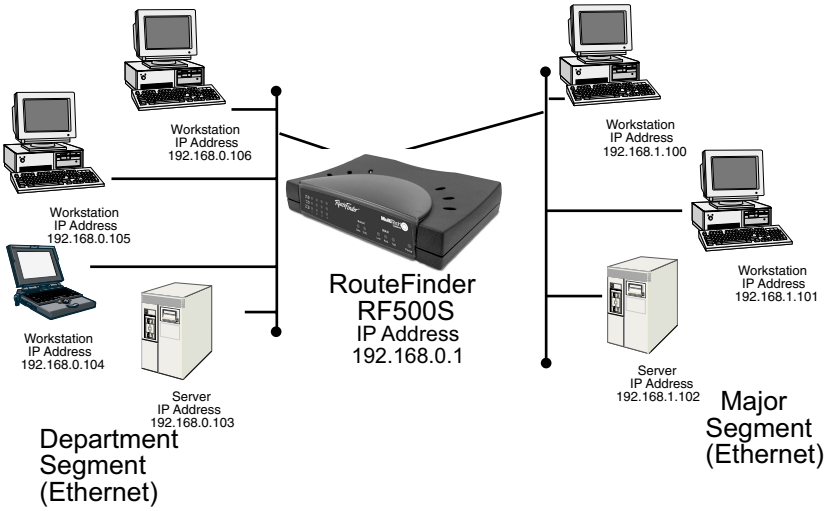


Connect Remote Site via Cable Modem

Connecting a Local Site by Segmenting the LAN

In this application, the RF500S is used to connect LAN segments within a local site.

Kernal: **IP Routing** Static Routing (Routing table to External or Internal Gateways)
• Firewall
External: Fixed External IP or DHCP client (Dynamic IP only)
Internal: Device Fixed IP
DHCP Server



Connect Local Site (Segmenting the LAN)

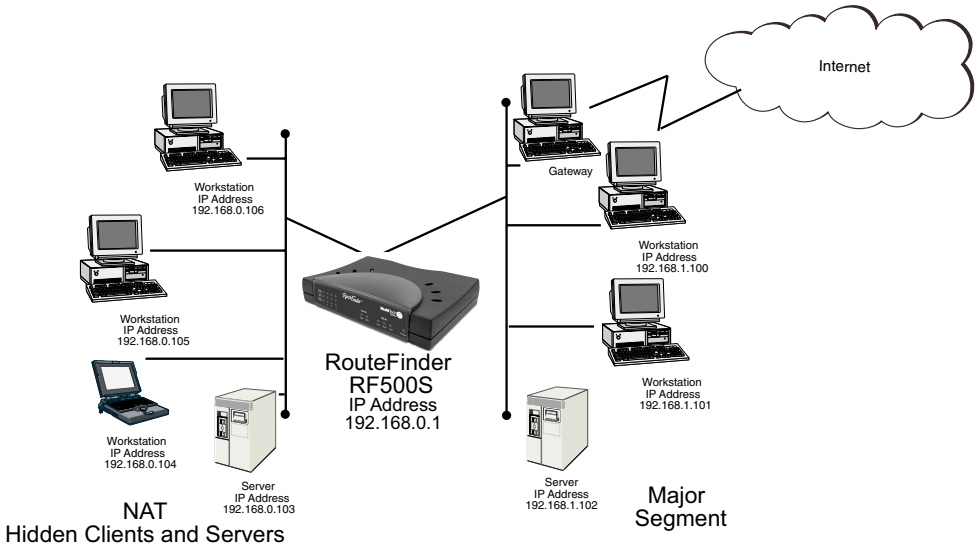
Connecting a Local Site to the Internet

In this application, the RF500S is used to connect up to 253 Internal IP addresses to the Internet using a single shared external IP address.

Kernal: **NAT** (outgoing TCP/IP connection sharing single External Port IP or using multiple IP Mapping)
- Virtual Server (allow incoming specific TCP/IP service request redirect to internal server)
- Firewall

External: Fixed External Port IP and mask DNS IP, Gateway IP or DHCP client (Dynamic IP for the device, DNS and Gateway assigned.)

Internal: Device Fixed IP
DHCP Server



Connect Local Site (I External IP address = 253 Internal IP addresses)

Specifications

Hardware	ARM RISC CPU 32 bit, 40MHZ 4MB DRAM and 512k Flash ROM UART Serial port controller
LAN Ports	Number of Ports: 4 Interface: 10Base T/100BaseTX, - One port can be used for uplink Standard: 802.3
WAN Ports	1 x 10BaseT 1 x RS232 (V.24) DTE Speed: Up to 460K asynchronous
Protocols	Security: PAP/CHAP, MSCHAP, NAT Firewall, RADIUS and Callback for remote access. Network: TCP/IP, IPX, DHCP, PPP, PPPoE Filtering: Protocol, port number, URL address and IP address
LED Indicators	1 indicator for Power On 3 indicators for WAN function (LINK, TxD, RxD) 2 indicators for Serial Async function (DATA, DCD) 3 indicators for each of 4 LAN ports functions (LINK/ACT, 100, FDX/COL)
Power Output	5VDC, 1000mA
Dimensions	7.1 in. (w) x 4.9 in. (h) x 1.4 in. (d) 18.1 cm x 12.5 cm x 3.5 cm
Weight	380g 13 oz.
Memory	RAM: 4MB Flash ROM: 512k
Operating Environment:	Temperature Range: 32 - 120 degrees F (0 - 50 degrees C) Humidity: 25-85% non-condensing
Approvals:	FCC Part 15 & CE Mark
Warranty	2 - year warranty

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Chapter 2 - Hardware Installation

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Hardware Installation

Safety

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in a wet location unless the jack is specifically designed for wet locations.
3. This product is to be used with UL and cUL listed computers.
4. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
5. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightening.
7. Do not use the telephone to report a gas leak in the vicinity of the leak.
8. To reduce the risk of fire, use only No. 26 AWG or larger Telecommunications line Cord.

Unpacking the RF500S

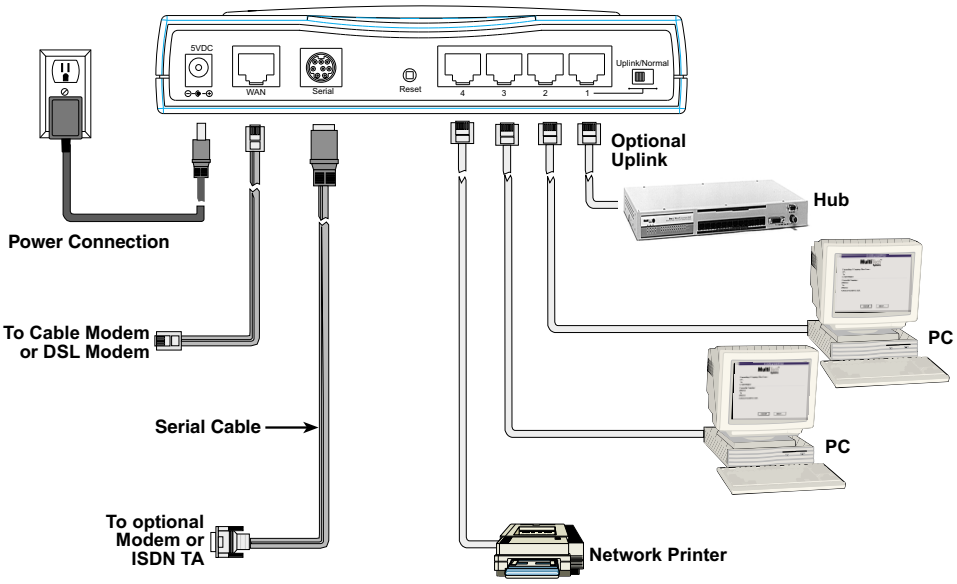
The RF500S shipping box contains the following items:

- System CD
- Tucows CD
- Power Supply
- The RouteFinder RF500S
- The RF500S RouteFinder Quick Start Guide
- A serial cable

If any of the items is missing or damaged, please contact Multi-Tech Systems.

Cabling

Cabling your RouteFinder requires making the appropriate connections to PCs, Cable or DSL modem, analog modem or ISDN TA (optional), AC power and the router. Because this device also acts as a DHCP server, after your device is properly cabled, you will need to follow the configuration instructions provided in the Software Installation and Configuration chapter.



Cabling the RouteFinder RF500S

1. Before beginning, turn the power off on all network devices (PCs, Cable, DSL modems, analog modems, ISDN TAs and the router).
2. Connect the Ethernet port of each PC or network device to one of the 4 LAN ports (if you are using the Uplink option, port number 1 cannot be used as a LAN port).
3. If you are using an analog modem, connect it to the Serial Async port.
4. If you are using the Uplink option to connect to another network segment, slide the *Uplink/ Normal* switch into the Uplink position. Connect the LAN cable to LAN port #1. Plug the other end of the LAN cable into another hub, router or switch.

   Note: *If you are not using the Uplink feature, place the switch in the Normal position.*
5. Connect a network cable from the cable or DSL modem to the 10 BT WAN port.
6. Connect the provided power supply cable to the 5VDC power port on the back of the router. Plug the power supply into an AC power outlet as shown above.
7. Power on your DSL modem or Cable.
8. If you are using an analog modem or ISDN TA, power on the device.
9. Press and hold the RouteFinder's Reset button for 3 seconds to restore the default settings.
10. You are ready to configure software for your RouteFinder and network PCs.

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Chapter 3 - Software Installation and Configuration

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Software Installation and Configuration

Before beginning the installation process, ensure that your system meets all hardware and software requirements:

- Intel 486 or higher processor.
- 10/100 BaseT cable to connect the RF500S to the network.
- One DSL or Cable Modem.
- A networked computer with Windows 95/98/2000, Windows NT 3.5 or higher and TCP/IP protocol installed (or, a non-Windows system with TCP/IP properly installed to enable Telnet configuration).
- Any Windows communication application for Dial-Out operation.
- Any PPP supported communication application for Dial-In operation.
- TCP/IP installed and configured on each workstation accessing the Internet.

Software Installation

The software installation process involves installing the RouteFinder Utilities, including RouteFinder Setup Wizard, RouteFinder Manager and RouteFinder Monitor. A description of each component follows:

RouteFinder Setup Wizard
The RouteFinder Setup Wizard provides a step-by-step process to assist you in entering all the basic settings needed to configure your RF500S for general use. All settings that are entered in the Setup Wizard can be found in their respective menus in the RouteFinder Manager.

RouteFinder Manager
RouteFinder Manager is the main program used to configure all settings for your RF500S. Complete information about options within the RouteFinder Manager can be found in the RouteFinder Manager chapter in this User Guide.

RouteFinder Monitor
RouteFinder Monitor is a multi-purpose utility designed to let you know the status of your RF500S connection. The monitor offers the ability to point and click on an event to access troubleshooting procedures. Refer to the RouteFinder Monitor chapter in this User Guide for more information.

Using RouteFinder Setup Wizard

Note: *Before beginning this procedure, ensure that your RF500S is properly connected to the network and is powered on.*

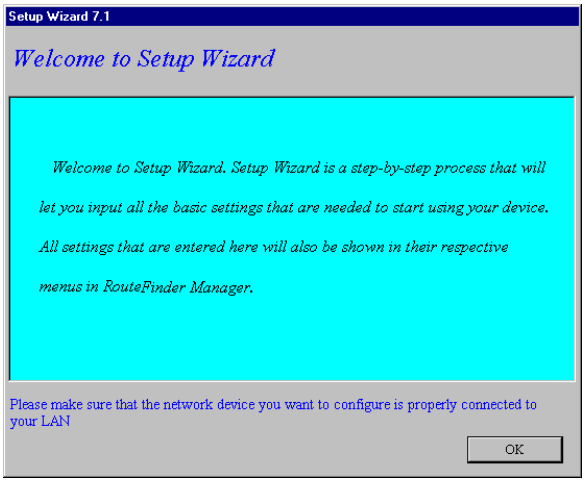
After installing the software, you may return to the RouteFinder Setup Wizard at any time, by clicking **Start** | **Programs** | **RouteFinder Manager** | **RouteFinder Wizard**.

Before running the Setup Wizard, it is strongly recommended that you exit all Windows programs.

1. Insert the RF500S System CD into your computer's CD-ROM drive. The RF500S System CD screen appears.

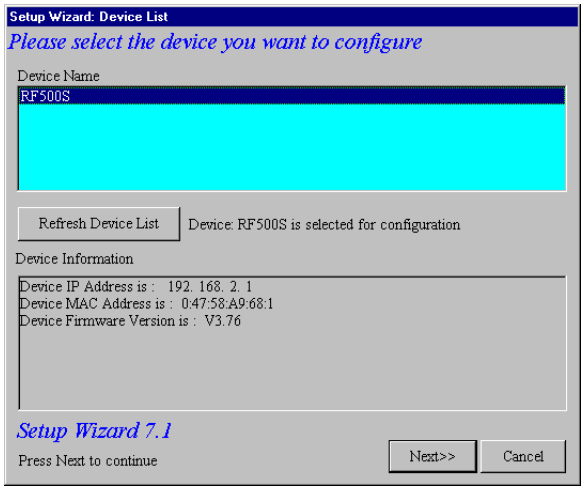
   Note: *If Autorun is disabled on your computer, use Windows Explorer to view the contents of the CD.* ***Double-click*** *the CD icon to display the RF500S System CD main screen.*

2. Click **Install Software**.
3. Follow the on-screen instructions to install the software.
4. When the software installation completes, the **Setup Wizard** dialog box displays.


Setup Wizard 7.1
Welcome to Setup Wizard
Welcome to Setup Wizard. Setup Wizard is a step-by-step process that will let you input all the basic settings that are needed to start using your device. All settings that are entered here will also be shown in their respective menus in RouteFinder Manager.
Please make sure that the network device you want to configure is properly connected to your LAN
OK

   Click **OK**.

5. The **Setup Wizard: Device List** dialog box displays. The Setup Wizard automatically checks your network for available network devices and displays them on the screen.


Setup Wizard: Device List
Please select the device you want to configure
Device Name
RF500S
Refresh Device List
Device: RF500S is selected for configuration
Device Information
Device IP Address is : 192. 168. 2. 1
Device MAC Address is : 0:47:58:A9:68:1
Device Firmware Version is : V3.76
Setup Wizard 7.1
Press Next to continue
Next>>
Cancel

Select the device you wish to configure from the **Device Name** list.

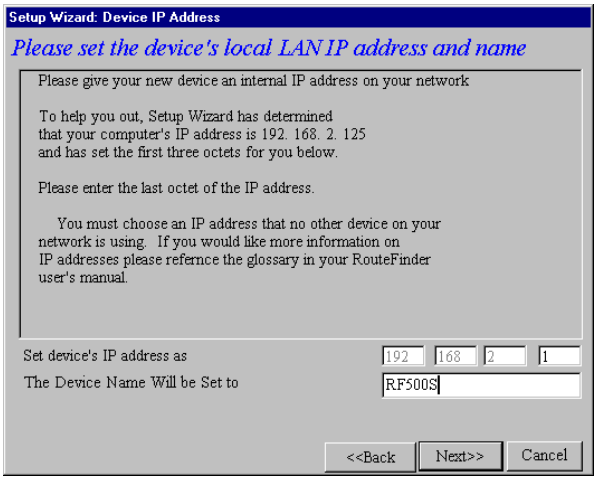
Record the values presented in the **Device Information** panel for later reference.

Device IP Address _____
Device MAC Address _____
Device Firmware Version _____

Click **Next>>**.

Note: *If a message appears indicating the device is not found, or you do not see the device you are attempting to configure listed, click the* ***Refresh Device List*** *button.*

6. The **Setup Wizard: Device IP Address** dialog box displays.


Setup Wizard: Device IP Address
Please set the device's local LAN IP address and name
Please give your new device an internal IP address on your network
To help you out, Setup Wizard has determined
that your computer's IP address is 192. 168. 2. 125
and has set the first three octets for you below.
Please enter the last octet of the IP address.
You must choose an IP address that no other device on your
network is using. If you would like more information on
IP addresses please refernce the glossary in your RouteFinder
user's manual.
Set device's IP address as
192
168
2
1
The Device Name Will be Set to
RF500S
<<Back
Next>>
Cancel

- **Enter** your local internal network's IP address for this device.

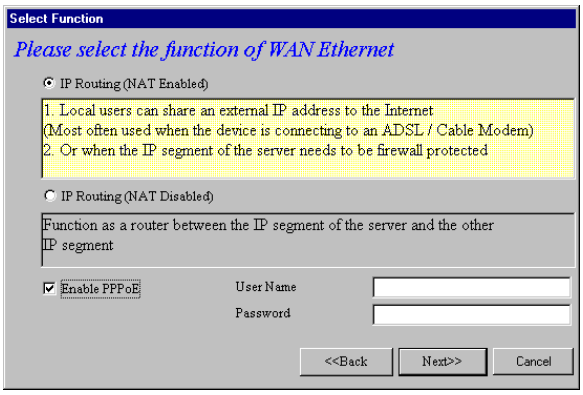
  The Setup Wizard will automatically detect the first three octets of your local IP address. You must enter the last octet only.

- If you wish, you can change the network name of your RouteFinder. If your ISP requires your device to have a name, you may use the value entered in this field.

- Click **Next>>** to continue. The device will search the network to ensure that the IP address is valid. This may take several seconds.

  Note: *If your ISP provided you with an IP address,* ***do not*** *enter that address in this field. Enter the IP address for this device on your local network. Refer to the Glossary in this User Guide for additional information on IP addressing.*

7. The **Select Function** dialog box displays.


Select Function
Please select the function of WAN Ethernet
IP Routing (NAT Enabled)
1. Local users can share an external IP address to the Internet
(Most often used when the device is connecting to an ADSL / Cable Modem)
2. Or when the IP segment of the server needs to be firewall protected
IP Routing (NAT Disabled)
Function as a router between the IP segment of the server and the other IP segment
Enable PPPoE
User Name
Password
<<Back
Next>>
Cancel

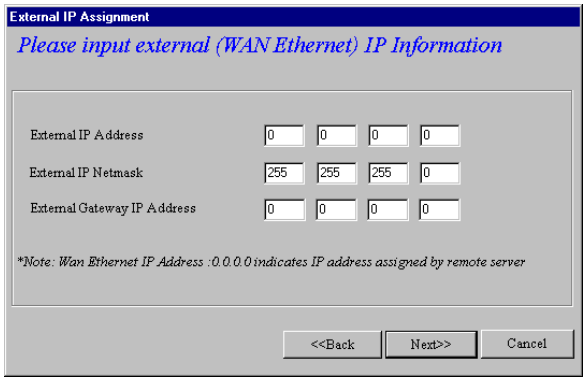
Select the function of the WAN Ethernet port by choosing *IP Routing (NAT Enabled) or IP Routing (NAT Disabled)*. If you are using NAT Enabled, you may also select *Enable PPPoE* .

- Select *IP Routing (NAT Enabled)* to allow local LAN clients to share one external IP address for accessing the Internet. This option is most often used when the RF500S is connected to a DSL or cable modem, or when the IP segment of the server needs firewall protection.
- Select *IP Routing (NAT Disabled)* to allow the RF500S to function as a router between IP segments. This option is ideal for organizations needing to segment workgroups.
- Select *Enable PPPoE* to use the RF500S with a time-base, rather than fixed-cost DSL modem connection. Enter the User Name and Password provided by your ISP. This option is most often used when connecting via DSL to the Internet.

Note: *Enable PPPoE is valid only when IP Routing (NAT Enabled) is selected.*

Click **Next>>**.

8. The **External IP Assignment** dialog box displays.


External IP Assignment
Please input external (WAN Ethernet) IP Information
External IP Address
External IP Netmask
External Gateway IP Address
*Note: Wan Ethernet IP Address :0.0.0.0 indicates IP address assigned by remote server
<<Back
Next>>
Cancel

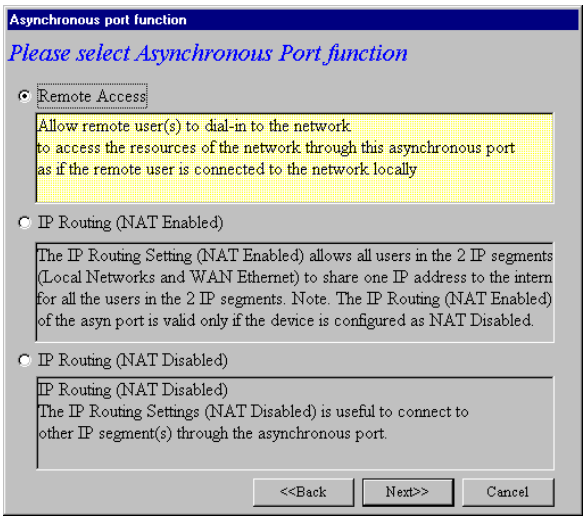
Enter the WAN Ethernet IP address information *provided by your ISP* or other external network administrator.

- In the *External IP Address* box, enter the WAN Ethernet IP Address.
- In the *External IP Netmask* box, enter the Netmask of the WAN Ethernet IP Segment (for Class C networks, the Netmask is generally set to 255.255.255.0).
- In the *External Gateway IP Address* box, enter the IP address of the Gateway to the destination network.

Note: *If your ISP uses dynamic IP addressing (DHCP), leave the External IP address and the External Gateway IP address at the default values of 0.0.0.0. Set the External IP Netmask to the default value of 255.255.255.0.*

Click **Next>>**.

9. The **Asynchronous port function** dialog box displays. Select **1) Remote Access**, **2) IP Routing (NAT Enabled)** or **3) IP Routing (NAT Disabled)**.


Asynchronous port function
Please select Asynchronous Port function
Remote Access
Allow remote user(s) to dial-in to the network
to access the resources of the network through this asynchronous port
as if the remote user is connected to the network locally
IP Routing (NAT Enabled)
The IP Routing Setting (NAT Enabled) allows all users in the 2 IP segments
(Local Networks and WAN Ethernet) to share one IP address to the intern
for all the users in the 2 IP segments. Note. The IP Routing (NAT Enabled)
of the asyn port is valid only if the device is configured as NAT Disabled.
IP Routing (NAT Disabled)
IP Routing (NAT Disabled)
The IP Routing Settings (NAT Disabled) is useful to connect to
other IP segment(s) through the asynchronous port.
<<Back
Next>>
Cancel

- Select *Remote Access* to allow remote users to dial-in to the network to access resources as if the remote user is connected to the network locally. **Remote Access instructions continue on page 24**.
- Select *IP Routing (NAT Enabled)* to allow all users in the two IP segments (LAN and WAN Ethernet) to share one IP address to the Internet. You may also select this option to use the serial async port for dial backup in the event the DSL or cable modem becomes unavailable.
- Select *IP Routing (NAT Disabled)* to connect other IP segments through the serial async port.

  IP Routing instructions continue on page 26.

  Note: *The IP Routing (NAT Enabled) feature of the serial async port is valid only if the WAN port is configured as NAT Disabled.*

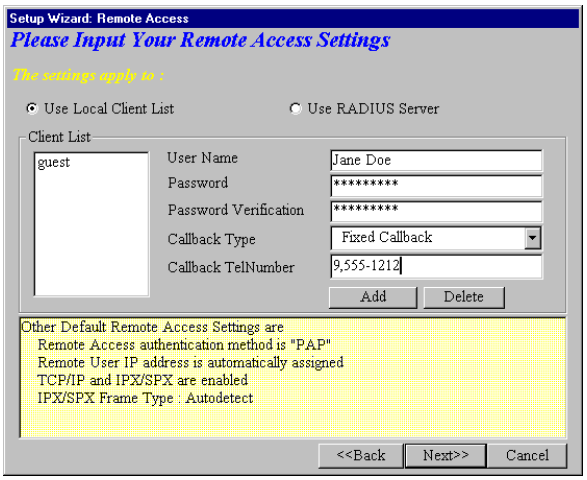
  Click **Next>>**.

1.) Remote Access

You must define the location of your remote user account database by selecting a) *Use Local Client List* or b) *Use RADIUS Server* .

Note: *The Local Client List allows you to add a maximum of 64 users.*

a.) Use Local Client List
Use Local Client List allows you to create an authentication database consisting of user names, passwords and dial-in options for each remote user. You must provide the following information for each client:



User Name:
Enter the User Name to authenticate the remote dial-in user.

Password:
Enter the Password to authenticate the remote dial-in user. Passwords are limited to 16 characters.

Password Verification:
Re-enter the remote dial-in user's password.

Callback Type:
Select one of the following three callback options for each remote client:

• *No Callback:* Select this option to allow the remote user to immediately connect to the network after being authenticated. *No Callback* is the default setting.

• *Fixed Callback:* This option allows you to specify a fixed callback telephone number for the user. After the PPP negotiation, the device will disconnect, then callback the telephone number you enter in the callback telephone number field. This option is best used for clients requiring callback security while dialing-in from the same location each time.

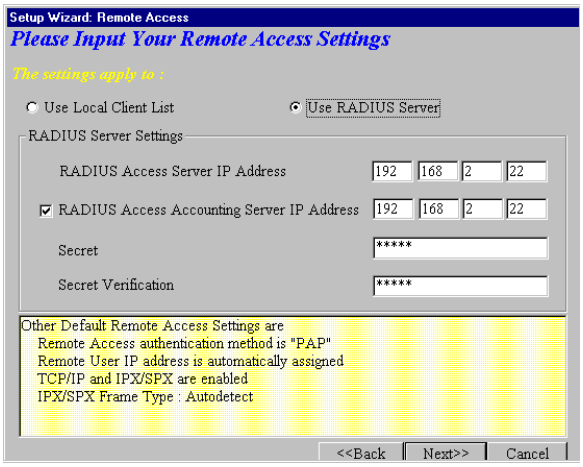
• *Variable Callback:* Select *Variable Callback* for remote users that travel or dial-in from various locations and need callback security. This option allows clients to specify the callback telephone number each time they connect to the network.

Click **Add** after entering information for each Local Client.

Click **Next>>** and continue with Step 10 when all users have been added to the database.

b.) Use RADIUS Server

Select this option if you would like your remote clients to be authenticated on a RADIUS server. You must enter the following RADIUS Server Settings:



RADIUS Access Server IP Address:
Enter the IP address of the RADIUS Access Server.

RADIUS Accounting Server IP Address:
Enter the IP address of the RADIUS Accounting Server.

Secret:
Enter your Secret RADIUS code or password.

Secret Verification:
To confirm your Secret code, re-enter your code or password.

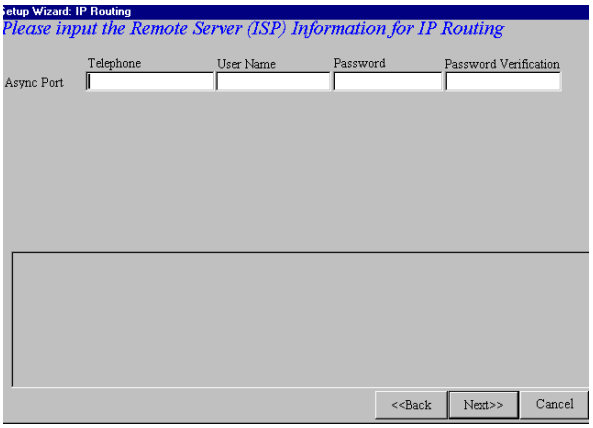
Note: *In most cases, the RADIUS Access Server and the RADIUS Accounting Server are the same server, so the IP addresses will also be the same.*

Click **Next>>** and continue with Step 10.

2.) IP Routing (NAT Enabled) and

3.) IP Routing (NAT Disabled)

If you select *IP Routing* for the asynchronous port, the **Setup Wizard: IP Routing** dialog box displays.



Enter the information required to dial-up and login to your ISP's remote server:

Telephone Number:
Enter the phone number used to dial your remote server (ISP).

Note: *If you must dial a number to get an outside line (e.g., "9", or "0"), enter the required number plus a "w"(wait) or a comma in the Telephone box. (e.g., 9w555-2323 or 9,,5552323) Each comma provides a 3-4 second delay.*

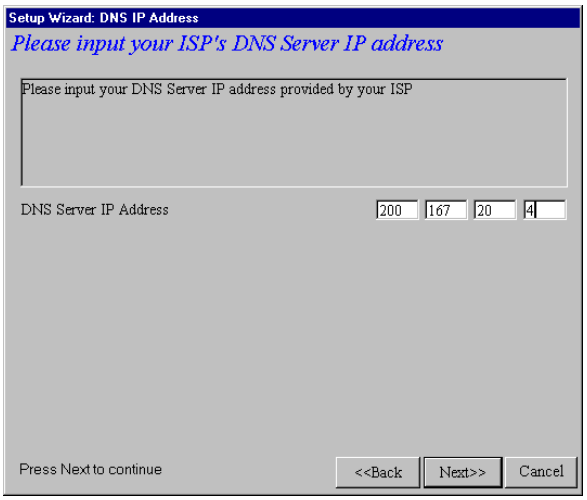
User Name:
Enter the User Name for your remote server or ISP account.

Password:
Enter the Password for your remote server or ISP account.

Password Verification:
Re-enter the password for your remote account.

Click **Next>>**.

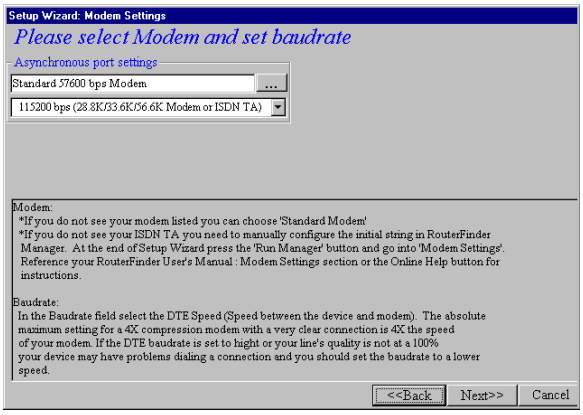
10. The **Setup Wizard: DNS IP Address** dialog box displays.



Enter your ISP's DNS Server IP address. If you are not sure of the IP address, contact your ISP. Refer to the Glossary in the User Guide for more information about the DNS Server.

Click **Next>>**.

11. The **Setup Wizard: Modem Settings** dialog box displays.


Setup Wizard: Modem Settings
Please select Modem and set baudrate
Asynchronous port settings
Standard 57600 bps Modem
...
115200 bps (28.8K/33.6K/56.6K Modem or ISDN TA)
Modem:
*If you do not see your modem listed you can choose 'Standard Modem'
*If you do not see your ISDN TA you need to manually configure the initial string in RouterFinder Manager. At the end of Setup Wizard press the 'Run Manager' button and go into 'Modem Settings'. Reference your RouterFinder User's Manual : Modem Settings section or the Online Help button for instructions.
Baudrate:
In the Baudrate field select the DTE Speed (Speed between the device and modem). The absolute maximum setting for a 4X compression modem with a very clear connection is 4X the speed of your modem. If the DTE baudrate is set to hight or your line's quality is not at a 100% your device may have problems dialing a connection and you should set the baudrate to a lower speed.
<<Back
Next>>
Cancel

The final step in configuring your RF500S for basic operations is to define your modem Manufacturer, Model and the DTE baudrate or speed of communication between the RF500S's serial async port and your modem or ISDN TA.

Select your modem and baudrate as described on the following pages.

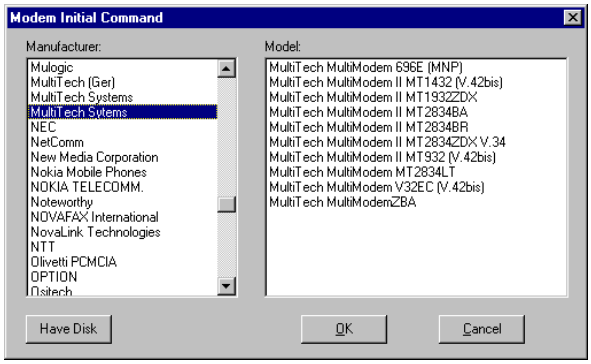
Note: *If you do not have a device attached to the serial async port, use the default modem values, and click* ***Next>>****.*

12. To select your **modem**, in the *Asynchronous port settings* box,

click

The system loads modem information.

13. The **Modem Initial Command** dialog box displays.



Select your modem manufacturer, then select the model from the list provided. Click **OK** (if your modem is not listed and you have a driver disk, click **Have Disk...** to install your modem).

Note: *This setting configures the initial string of the asynchronous port on the RF500S so that it will know how to communicate with your modem. If you are using an analog modem and your modem is not included in the selection list, in most cases, Standard Modem will work. If you are using an ISDN TA, refer to the ISDN TA's User Guide for information on the initialization and hang up strings. Use RouteFinder Manager to enter modem strings.*

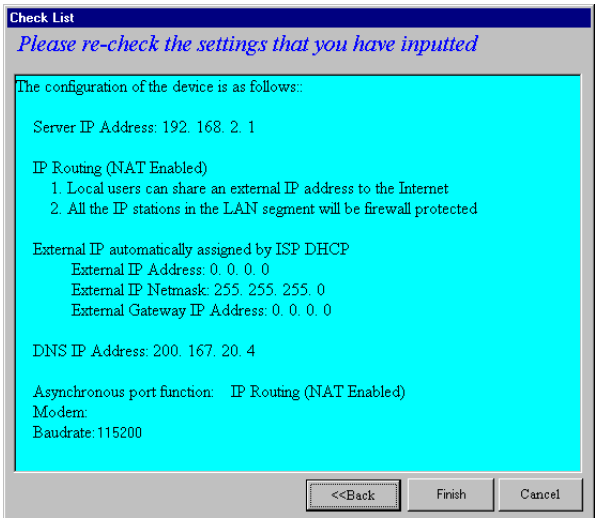
14. The **Setup Wizard: Modem Setting** dialog box re-displays.

    Use the *Asynchronous port settings* list to select the **baudrate**. Select the DTE speed (i.e., the speed of communication between the asynchronous port of the RF500S and the modem). For DCE speed compression modems, this value can normally be set to about 4 times the speed of your modem. Keep in mind that if you set the baudrate too high, the dial-up connection may fail.

    Note: *You may need to set a lower baudrate since the theoretical maximum connection speed may not be attainable due to variations in quality of phone line and ISP connections.*

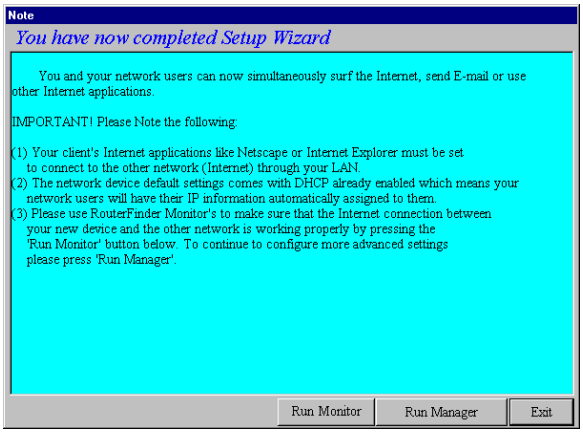
    Click **Next>>** to complete the basic configuration.

15. The **Check List** dialog box displays summarizing your configuration selections. Ensure that all values have been correctly entered. If you find an incorrect setting, click **<<Back** to return to the screen containing the error and correct it. When complete, use the **Next>>** button to return to the **Check List** dialog box.


Check List
Please re-check the settings that you have inputted
The configuration of the device is as follows::
Server IP Address: 192. 168. 2. 1
IP Routing (NAT Enabled)
1. Local users can share an external IP address to the Internet
2. All the IP stations in the LAN segment will be firewall protected
External IP automatically assigned by ISP DHCP
External IP Address: 0. 0. 0. 0
External IP Netmask: 255. 255. 255. 0
External Gateway IP Address: 0. 0. 0. 0
DNS IP Address: 200. 167. 20. 4
Asynchronous port function: IP Routing (NAT Enabled)
Modem:
Baudrate:115200
<<Back
Finish
Cancel

Click **Finish** to complete the configuration.

16. The **Note** dialog box displays indicating that you have completed the Setup Wizard.


Note
You have now completed Setup Wizard
You and your network users can now simultaneously surf the Internet, send E-mail or use other Internet applications.
IMPORTANT! Please Note the following:
(1) Your client's Internet applications like Netscape or Internet Explorer must be set to connect to the other network (Internet) through your LAN.
(2) The network device default settings comes with DHCP already enabled which means your network users will have their IP information automatically assigned to them.
(3) Please use RouterFinder Monitor's to make sure that the Internet connection between your new device and the other network is working properly by pressing the 'Run Monitor' button below. To continue to configure more advanced settings please press 'Run Manager'.
Run Monitor
Run Manager
Exit

Read the “IMPORTANT!” information contained in the dialog box. Choose **Run Monitor** (recommended), **Run Manager** or **Exit**.

Testing your Connection

When you select Run Monitor, the RouteFinder Monitor program loads.

1. To test your current settings, select **Test Connection**. Select **Connect Port 1** to test the WAN port. Select **Connect Port 2** to test the serial async port. The monitor activity will appear in the display window. Refer to the RouteFinder Monitor chapter in this User Guide for additional information about the monitoring capabilities of the RF500S.
2. After successfully using the Test Connection option in Run Monitor, refer to the LAN Client Settings chapter of this User Guide to continue with your installation by configuring your LAN workstations.

   Note: *If a problem occurs while testing your connection, or you need to configure more advanced options for your RouteFinder, use RouteFinder Manager by selecting* ***Programs*** *|* ***RouteFinder Manager*** *|* ***RouteFinder Manager****.*

RouteFinder™

Chapter 4 - Telnet

MultiTech® Systems

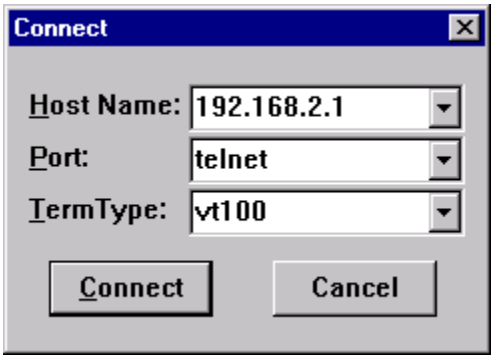
Using Telnet to Configure your RouteFinder

Telnet is a telecommunications software utility which allows you to access a remote device. The RouteFinder RF500S has a built-in Telnet Server that enables a Telnet client to remotely configure the device using a menu system.

Important: *Non-Windows operating system users must use the Telnet menu system to define the function of the WAN and async ports, to define how IP addresses are administered, to configure IP addresses on your local and remote systems and to set up any necessary virtual server, routing table and packet filtering options.*

Note: *To successfully configure your router using Telnet, TCP/IP must be correctly configured on your computer. The router and computer must also be located on the same subnet.*

1. Start your telnet session and connect to the RouteFinder RF500S using the router's default IP address of *192.168.2.1* and vt100 terminal emulation.



   If you are using a graphical interface such as the one shown above, click **Connect**.

2. When prompted to input the Router Password, press **Enter**.

3. The RF500S Telnet Server Menu displays.

```
Please input ROUTER password
Password:

ROUTER SETTINGS
a). ROUTER IP ADDRESS                <192.168.2.1>
b). ROUTER SUBNET MASK               <255.255.255.0>
c). ROUTER NAME                      <RF500S>
d). ROUTER PASSWORD                  <>
e). WAN ETHERNET MAC ADDR.           <00:00:00:00:00:FF>
f). WAN ETHERNET SETTINGS            <INTERNET ACCESS>
g). ASYNC PORT SETTINGS              <IP ROUTING>
h). ROUTER DNS IP ADDRESS            <0.0.0.0>
i). DHCP SERVER                      <ENABLE>
j). VIRTUAL SERVER                   <DISABLE>
k). ROUTING TABLE
l). CLIENT FILTER SETTINGS
m). LOAD DEFAULT SETTINGS
n). SAVE AND RESTART SERVER
o). DIAGNOSTIC
q). QUIT
Select ?
```

   To use the menu, type the letter corresponding to the parameter you'd like to change.

   Depending on the parameter you are changing, you are presented with an open field into which you may type new information, or you are presented with a list of options from which you may select a value. Each menu item is described in the following pages.

   Note: *After entering parameters for all settings that you want to change, continue to type* ***"q****" to return to the previous menu until you reach the main Telnet Server menu. Select Save and Restart Server to save your new configuration.*

Router IP Address

Enter the IP address assigned to the RF500S on your local network. The new address will take effect after you have selected *Save and Restart Server*.

Router Subnet Mask

Enter the subnet mask for your local network.

Router Name

Enter a network name for the RF500S. If your ISP requires your device to have a name, you may use the value entered in this field.

Router Password

The default is no password. If you choose to use a password, ensure that you write the password down and keep it in a safe place. If you forget the password, contact the Multi-Tech System's Technical Support group for assistance. Refer to Chapter 10 in this User Guide for contact information.

WAN Ethernet MAC addr.

This field displays the current MAC address of your router. Edit this field only if required by your remote system or ISP.

WAN Ethernet Settings

Define the function of the WAN port by selecting Internet Access (IP Routing - NAT Enabled) or LAN - to- LAN access (IP Routing - NAT Disabled). Refer to the WAN Ethernet Segment section of the RouteFinder Manager chapter for more information.

```
f). WAN Ether  SETTINGS              <INTERNET ACCESS>
FUNCTION SETTING
a). INTERNET ACCESS
b). LAN-to-LAN ACCESS
Select ?
```

Internet Access
If you use the WAN port for Internet Access, you must configure the following options:

```
INTERNET ACCESS PORT SETTING
a). WAN ETHERNET PORT IP ADDRESS      <0.0.0.0>
b). WAN ETHERNET PORT IP NETMASK      <255.255.255.0>
c). WAN ETHERNET GATEWAY IP ADDRESS   <0.0.0.0>
d). PPPoE                             <ENABLE>
e). PPPoE USER NAME                   <>
f). PPPoE PASSWORD                    <>
q). PREVIOUS MENU
Select ?
```

Enter the IP port information provided by your ISP or other external network administrator.

Note: *If your ISP uses dynamic IP addressing, leave the External Port IP address and External Gateway IP address at the default values of 0.0.0.0. Set the External IP Netmask to the default value of 255.255.255.0.*

LAN -to- LAN Access
To use the WAN port to connect to another LAN, you must configure the following:

```
LAN to LAN PORT SETTING
a). WAN ETHERNET PORT IP ADDRESS      <0.0.0.0>
b). WAN ETHERNET PORT IP NETMASK      <255.255.255.0>
q). PREVIOUS MENU
Select ?
```

Enter the IP and Netmask address of the network to which you are connecting.

Async Port Settings

The async port may be used for *IP Routing* or *Remote access*. For more information, see the Async Port section of the RouteFinder Manager chapter.

IP Routing
If you will use the async port for IP Routing, enter the following information as described:

```
IP ROUTING PORT SETTING
a). TELEPHONE NUMBER                <>
b). USER NAME                       <>
c). PASSWORD                        <>
d). IDLE TIMEOUT                    <5>
e). SERIAL BAUDRATE                 <115200>
f). MODEM PRE-INITIAL STRING        <AT>
g). MODEM INITIAL STRING            <AT S0=1>
h). MODEM DIALUP STRING             <ATDT>
i). MODEM HANGUP STRING             <ATH0>
j). LOGIN SCRIPT                    <DISABLE>
k). EDIT LOGIN SCRIPT
l). EXTERNAL IP ADDRESS             <0.0.0.0>
m). NAT FUNCTION                    <ENABLE>
n). ASSIGN REMOTE IP                <DISABLE>
q). PREVIOUS MENU
Select ?
```

Telephone number:
Enter the phone number the async device must dial to connect to the remote system.

User Name:
Enter the User Name that will be used for authentication on the remote system.

Password:
Enter the Password associated with the User Name for the remote system.

Idle Timeout:
Enter the amount of idle time allowed to pass before the connection times out. The default value is 5 minutes.

Serial Baudrate:
Use the list to select the appropriate baudrate of the modem attached to your async port. You may need to select a lower speed to ensure a quality connection.

Modem Pre-Initial string:
Consult your modem or ISDN TA User Guide for this information. The default value will work for most analog modems.

Modem Initial string:
Consult your modem or ISDN TA User Guide for this information.

Modem dialup string:
Consult your modem or ISDN TA User Guide for this information.

Modem hangup string:
Consult your modem or ISDN TA User Guide for this information.

Login script:
Select Enable or Disable.

Edit login script:
Refer to the RouteFinder Manager chapter of this User Guide for information on editing scripts.

External IP address:
Enter the IP addresss of the remote device to which you are connecting.

NAT Function:
Select Enable or Disable. Refer to the Glossary in this User Guide for additional information on NAT.

Assign Remote IP:
Select Enable or Disable. If you select Enable, you will be prompted to enter an address to be assigned to the remote system.

Remote Access:
To configure the async port for Remote Access, enter values for each of the following fields:

Remote Access Port Settings

```
REMOTE ACCESS PORT SETTING
a). IP ASSIGNED METHOD              <AUTOMATICALLY>
b). PROTOCOLS                       <BOTH IP & IPX ENABLED>
c). IPX/SPX FRAME TYPE              <AUTODETECT>
d). AUTHENTICATION METHOD           <PAP>
e). EDIT USER DATABASE
f). IDLE TIMEOUT                    <0>
g). SERIAL BAUDRATE                 <115200>
h). MODEM PRE-INITIAL STRING        <AT>
i). MODEM INITIAL STRING            <AT S0=1>
j). MODEM DIALUP STRING             <ATDT>
k). MODEM HANGUP STRING             <ATH0>
l). EDIT LOGIN SCRIPT
m). RADIUS SERVER                   <ENABLE>
n). RADIUS ACCESS SERVER IP         <0.0.0.0>
o). RADIUS ACCOUNTING SERVER IP     <0.0.0.0>
p). RADIUS SECRET                   <>
q). PREVIOUS MENU
```

IP Assigned Method:
Select the method the client will use to have their IP address assigned.

Protocols:
Default value is *Both IP and IPX enabled*. You may select to use only one protocol, however if you are connecting to a Netware server, you must have IPX enabled.

IPX/SPX Frame Type:
The default value is *Autodetect*. If you have problems with your network connection, you may select Ethernet_II, Ethernet_802.3, Ethernet 802.2 or Ethernet_snap.

Authentication Method:
Select either None, PAP or CHAP. Refer to the RouteFinder Manager chapter of this User Guide for additional information.

Edit User Database:
To add users to the database, select the next available letter. Enter the User Name, Password and Callback type for each user that you add to the database. You may enter up to 64 remote clients.

Idle Timeout:
The default value is 5 minutes.

Serial Baudrate:
Select one of the available options. You may need to use a slower speed to ensure a quality connection.

Modem Pre-initial string:
Refer to your modem or ISDN TA User Guide for information. The default value will work for most analog modems.

Modem Initial string:
Refer to your modem or ISDN TA User Guide for information.

Modem Dialup string:
Refer to your modem or ISDN TA User Guide for information.

Modem Hangup string:
Refer to your modem or ISDN TA User Guide for information.

Edit login script:
Select this option to edit the login script executed when the client connects to the network. Refer to the RouteFinder Manager chapter of this User Guide for additional information about creating and editing scripts.

RADIUS Server:
Select *Enable* to configure remote users to authenticate on a RADIUS Server.

RADIUS Access Server IP:
Enter the IP address of the RADIUS Access server.

RADIUS Accounting Server IP:
Enter the IP address of the RADIUS Accounting server. In most configurations, the Access and Accounting server are located on the same machine, so the IP address is the same for both fields.

RADIUS Secret:
Enter the secret code or password for the RADIUS Server.

Router DNS IP Address

Enter the IP address of your Internet Service Provider's DNS server.

DHCP Server

You may select *Disable* or *Enable*. If you would like the RF500S DHCP server function to provide IP information to workstations as they connect to the network, select Enable. When you enable DHCP, you will be prompted to provide the beginning and ending IP addresses in the range of addresses administered by your RouteFinder. Refer to the LAN DHCP section of the RouteFinder Manager chapter of this User Guide for additional information.

Virtual Server

Select *Disable* or *Enable*. If you select Enable, you may enter the external and internal IP Addresses necessary to allow remote clients to access specific devices on your network via the Internet. Refer to the General Settings section of the RouteManager chapter in this User Guide for more information about Enabling IP Mapping.

Routing Table

The Routing Table option lets you create a routing table so your RouteFinder will route IP packets to the proper network. For more information, refer to the Routing Table section of the RouteFinder Manager chapter of this User Guide.

Client Filter Settings

The Filter Settings option allows you to define which packets are allowed to either pass through, or be blocked from passing through the RF500S ports. You may filter packets for network services including Mail, WWW, FTP, Telnet and News. See the Filter Settings section of the RouteFinder Manager chapter for more information about filtering options.

Load Default Settings

Use this option to return the router to the factory default settings.

Save and Restart Server

This option saves your RouteFinder configuration into Flash memory and restarts the device to enable the settings to take effect. The system will pause while settings are being saved.

Note: *After completing your configuration, you must select Save and Restart Server or your settings will be lost when the device is powered off.*

Diagnostic

The Diagnostic option performs basic testing of the RouteFinder, displays information about your firmware and offers options for assigning the LAN and WAN MAC addresses as may be required by your ISP.

```
o). DIAGNOSTIC
. Firmware Code Version V3.92
. DRAM TESTING.................OK
. Firmware Code Checksum......PASS
. UM9008 WAN ETHER............PASS
. UM9008 WAN ETHER MAC........ 00:00:00:00:00:FF
. MAC ADDR for LAN............ 00:00:00:00:01:FF
>>>>
Type  'p' to assign WAN MAC.
      'n' to assign LAN MAC.
   other to Exit.
```

Type any key to return to the main menu.

RouteFinder™

Chapter 5 - RouteFinder Manager

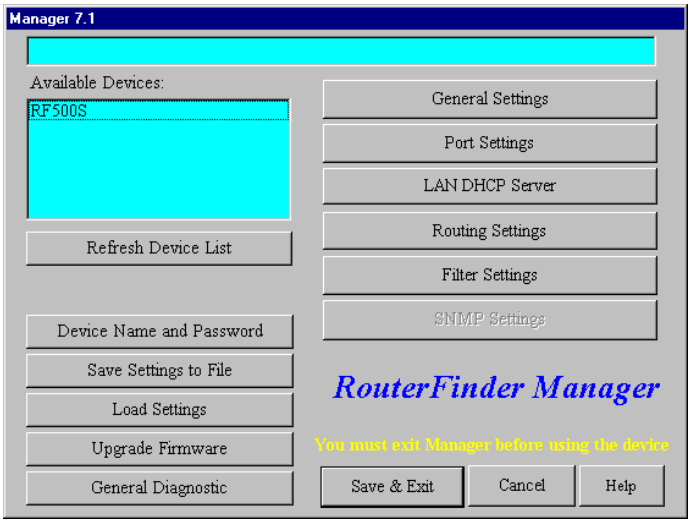
MultiTech® Systems

RouteFinder Manager

RouteFinder manager is the main program used to configure all the settings of your RF500S.

1. To run RouteFinder Manager, click on the RouteFinder Manager icon on your desktop, or click **Start** | **Programs** | **RouteFinder Manager** | **RouteFinder Manager**.

2. The **Manager** dialog box displays.



3. The RF500S automatically searches your network for devices available for configuration and displays them in the **Available Devices** list box.

   Note: *Before using any of the Manager options, you must* ***select*** *the device you are attempting to configure from the Available Devices list. If you need to update the list, click* ***Refresh Device List****. You must exit RouteFinder Manager before using the device.*

   After you have selected a device from the *Available Devices* list, the **Status** field provides information about the name, IP address, MAC address and Firmware version of your RouteFinder.

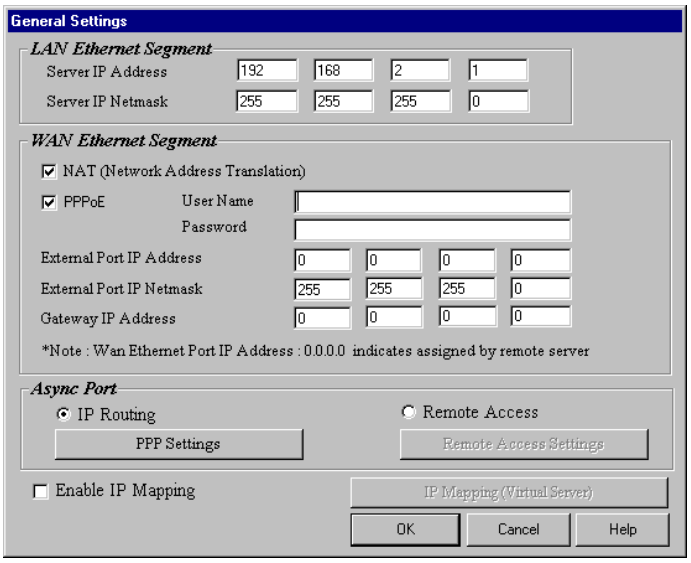
   The buttons in the left column of the screen offer the ability to change the device's name and password, save and load settings, upgrade the firmware or run general diagnostics on the device. The buttons in the right column provide access to advanced configuration options for General Settings, Port Settings, LAN DHCP Server Options, Router Settings and Filter Settings. Additional information about all of these options is included in this chapter.

   Note: *If the IP address of the device you are attempting to configure is not within the same subnet, the* ***"Please Set the Device IP"*** *dialog box displays, requesting you to input an IP address in the same subnet.*

   Should an error message appear, refer to the Troubleshooting chapter of this User Guide.

General Settings

After selecting your device from the *Available Devices* list, select **General Settings** to view or change all of the major network settings for the RF500S including LAN and WAN Ethernet segment settings, DNS information, IP Routing and Remote Access settings. Most of the settings on these screens were entered in Setup Wizard; however, some important settings can be entered only in RouteFinder Manager.



LAN Ethernet Segment

Server IP address:
This IP address is the internal LAN IP address of the RF500S. The address entered into the Setup Wizard is displayed here (e.g., 192.168.2.1).

Server IP Netmask:
The RF500S subnet mask generally can be left at the default value of 255.255.255.0.

WAN Ethernet Segment

Select **NAT (Network Address Translation)** to provide firewall protection and enable all local LAN users to share one IP address to access the Internet. If the NAT box is *not* checked, the WAN Ethernet is configured as a router to route network traffic between the LAN Ethernet segment and the WAN Ethernet segment. The External Port IP Addresses are provided by your ISP or remote system administrator.

PPPoE:
If your ISP uses Point -to- Point Protocol over Ethernet for authentication purposes, select the PPPoE box and enter your ISP account User Name and Password in the fields provided.

External Port IP Address:
Enter the IP address provided by your ISP or remote system administrator.

External Port IP Netmask:
Enter the subnet mask of the port as provided by your ISP or remote system administrator.

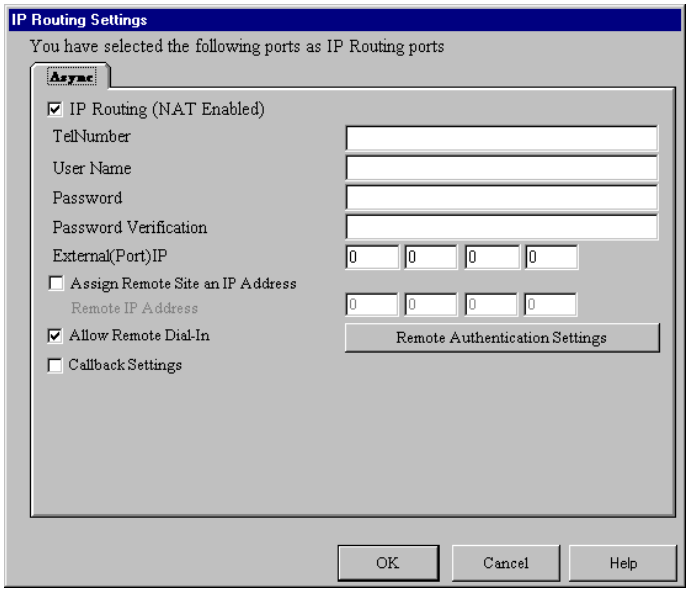
Gateway IP Address:
Enter your ISP or remote network's Gateway IP address.

Note: *If your ISP uses a DHCP server to automatically assign a login IP address, subnet mask, gateway IP address or DNS IP address, enter 0.0.0.0 as your External Port IP Address and the Gateway IP Address.*

Async Port

The Async Port can be configured to provide either *IP Routing* or *Remote Access*. IP Routing is used to connect your network to another router through the Serial async port. Remote Access allows remote users to dial-in to the device to access and share network resources as if they were logged on to the network locally.

1. To configure the RF500S for IP Routing, select **IP Routing** in the *Async Port* section of the **General Settings** dialog box.
2. Click **PPP Settings**.
3. The **IP Routing Settings** dialog box displays.



IP Routing (NAT Enabled):

If NAT is enabled, all local users will be firewall protected and will share one IP address through the Async port. Enter values in the fields as described:

Tel Number:
Enter the phone number required to access your ISP.

User Name:
Enter the account user name to be authenticated by your ISP.

Password:
Enter the user account password to be authenticated by your ISP.

Password Verification:
Re-enter the user account password for verification.

External (Port) IP:
Enter the fixed IP address provided by the remote site System Administrator. If this address is automatically assigned by the remote site DHCP server, enter 0.0.0.0

Assign Remote Site an IP Address:
Check the box if you will specify the IP Address of the remote site.

Remote IP address:
Enter the IP address the remote site will use.

Allow Remote Dial-In

This option allows a remote site to dial-in to this network.

1. From the **IP Routing Settings** dialog box, select **Allow Remote Dial-In**.
2. Click **Remote Authentication Settings**.
3. The **Remote Connection Authentication** dialog box displays.

4. You must select one of three methods to define the authentication protocol to be used when a remote site is dialing in to your site. You may select:
   • None - No authentication needed.
   • PAP - User Name and unencrypted Password are transmitted over the network.
   • CHAP - DHCP sends a key which is used to encrypt the user name and password. Encryption provides added protection from potential interception of authentication information.

   Note: *If you select PAP or CHAP, you must indicate where the authentication process should occur, by selecting Use Local Settings, Use Local Client List or Use RADIUS Authentication. Refer to* ***Remote Connection Authentication Settings*** *following this section.*

5. Click **OK** when complete.

Callback Settings

From a remote site, you can trigger your RF500S to establish a connection with your ISP.

1. Click *Callback Settings* and select one of three call back options:

   a. *No Callback*

   b. *Trigger (ISP) Server Connection* **-** The RouteFinder will establish a connection with the ISP server after a remote user dials into the asynchronous port. The device can be triggered to automatically establish a connection with the ISP in one of two ways:

   •The ISP server is dialed after the RF500S receives a PPP (modem) connection from a remote user.

   •The RF500S makes the connection to the ISP server after receiving a regular telephone call. The remote user calls the RF500S async port to trigger the connection to the ISP server.

   c. *Remote Callback* - After dialing, the RF500S hangs up and waits for the remote site to callback. You must enter the callback telephone number (the telephone number the device should call) in the **Tel Number** field.

2. Click **OK** to complete.

Remote Connection Authentication Settings

When you select Allow Remote Dial-in, you must determine the method that remote users must use to be authenticated on your system. If you choose the *PAP* or *CHAP* authentication protocol, you must select *Use Local Settings*, *Use Local Client List* or *Use RADIUS Server* authentication.

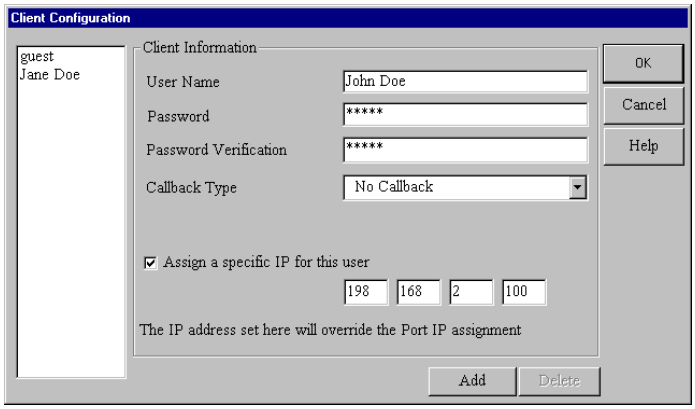
Use Local Setting

You may create a *Remote User Name* and *Remote Password* to log in to the system. All users must type the same user name and password that you specify.

Use Local Client List

The Local Client list is a list of all User Names and Passwords that can access your network from a remote site. When a remote user dials in to the RF500S, the user's access profile information (user name, password, callback status, etc.) is validated by checking the user information in this list. The RF500S can include up to 64 users in the Local Client list. Click Local Client List to add your remote users.

Important: *The RF500S is set up with a default user of* ***guest*** *which requires no password. For security reasons, either delete the guest user id guest or provide it with a password.*



Client Information

For each new remote user added to the system, enter the following information:

User Name:
Specify a user name with a maximum of 16 characters.

Password:
Specify the password corresponding to the user name. Passwords are limited to 16 characters.

Password Verification:
Verify the password by re-entering the user password in the box provided.

Callback Type:
The callback feature provides an added level of security to your dial in system. A remote client dials in to the network and then disconnects. The RF500S then calls the client back. The feature can be implemented using *no callback*, *fixed callback* or *variable callback*.

No Callback:
The RouteFinder does not perform a callback function. This is the default setting.

Fixed Callback:
The RouteFinder will connect to the client by dialing the number specified in the *Your TelNumber* field.

Variable Callback:
This option allows the remote client to specify the phone number the RouteFinder should callback each time a dial up connection is established.

Assign a specific IP address for this user:

Select this option if you would like to have a specific IP address assigned to this user. Enter the IP address in the field provided. This IP address will be used each time the client logs in and will override the *Assign Remote Site an IP Address* option as shown in the **IP Router Setting** dialog box, *Async* tab.

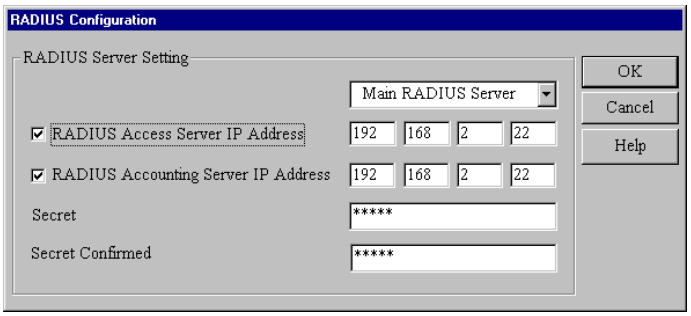
Click **Add** to complete adding this client to the Local Client List.

Use Radius Authentication

Choosing RADIUS Authentication allows you to use the user information (user name, password, IP address, etc.) stored on a separate RADIUS server on the network.

Note: *A RADIUS Server (Remote Authentication Dial-In Service) is an accounting and authentication system used by many large companies and Internet Service Providers (ISPs). After a client dials in to the network and enters their username and password, the information is passed to a RADIUS server. The RADIUS server checks that the information is correct, and then allows access to the system.*

1. From the Remote Access Settings dialog box, in the *Remote Users Authentication* section, click **Use RADIUS Authentication**, then click **RADIUS Setup**.
2. The **RADIUS Configuration** dialog box displays.



3. Use the List box to select the *Main* or *Backup RADIUS Server* from which the device will be authenticated.
4. Complete the provided fields for the Access and Accounting Server fields:
   RADIUS Access Server IP Address:
   Enter the IP Address of the RADIUS Access Server.

   RADIUS Accounting Server IP Address:
   Enter the RADIUS Accounting Server IP Address

   Note: *In most cases, the RADIUS Accounting Server and the Access server are the same device. If this is true for your configuration, enter the same IP address in both fields.*

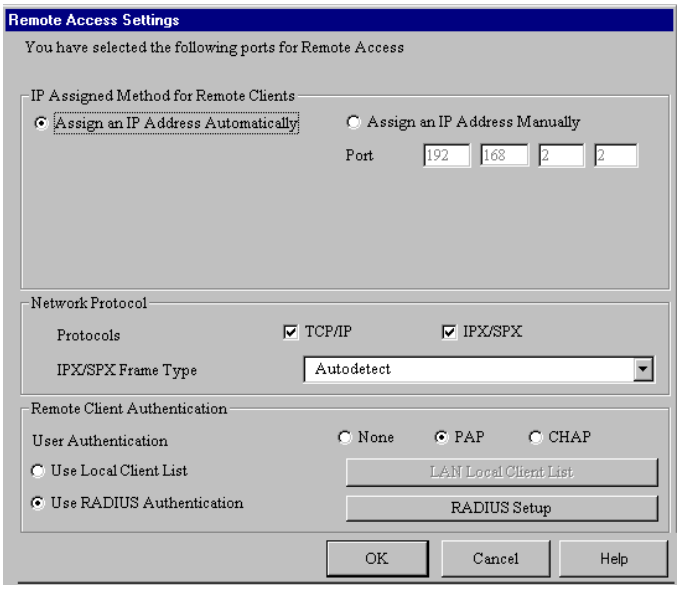
   Secret:
   Enter your Secret RADIUS code or password.
   Secret Confirmed:
   Re-enter your Secret RADIUS code.

   5. Click **OK** when complete.

Remote Access - Remote Access Settings

1. From the **General Settings** dialog box, *Async Port* section, select **Remote Access** and click **Remote Access Settings**.

2. The **Remote Access Settings** dialog box displays.



Complete the fields as follows:

IP Assigned Method for Remote Clients:
A remote client must have an IP address to connect to the network. IP addresses may be assigned *automatically* from a designated IP address pool using DHCP, or the IP address may be *manually* assigned.

Assign an IP Address Automatically:
The RS500S DHCP feature will issue the remote site user an IP address automatically if the DHCP function is enabled. If DHCP is disabled, the device will automatically search for a DHCP server and request an IP address for the remote client.

Assign an IP address manually:
Enter an IP address for the remote client.

Network Protocols:
You must select the network protocols you would like to enable for the dial-in service. The default enables both TCP/IP and IPS/SPX. If you do not need both protocols, you may disable one of them. If you are connecting to a Netware Server, IPX/SPX must be enabled.

IPX/SPX Frame Type:
The RouteFinder RF500S can automatically detect what kind of IPX/SPX frame type you are using. You may manually select a frame type by using the list box.

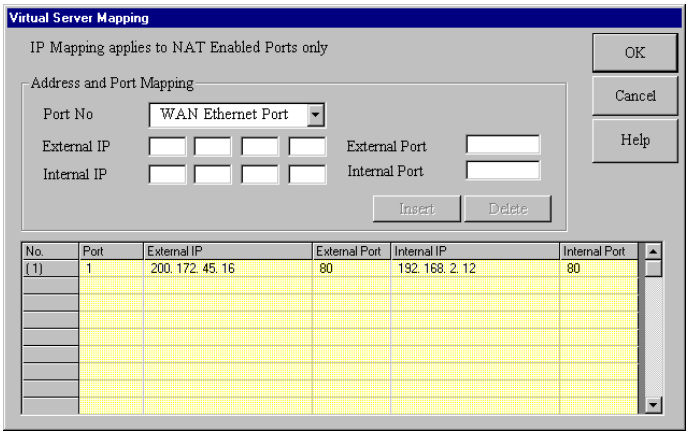
Remote Client Authentication:
Remote authentication settings allow you to specify how you would like to authenticate remote users. You may select *Use Local Client List* or *Use RADIUS Authentication* (refer to Remote Connection Authentication Settings in this chapter for more information). Choosing RADIUS configuration allows you to use the user information (user name, password, IP address, etc.) stored on a separate RADIUS server on the network.

3. Click **OK** when complete.

Enable IP Mapping - Virtual Server

IP Mapping is available only when NAT is enabled. If NAT is enabled for a particular port, that port is firewall protected. The *Enable IP Mapping* function allows you to open a "hole" in your firewall to allow access to your LAN via the Internet. For example, you can use the IP mapping function to access an FTP server on your LAN via the Internet. IP Mapping is most suitable to fixed or static IP addressing.

1. To enable IP Mapping, from the **General Settings** dialog box, select **Enable IP Mapping**, then click **IP Mapping (Virtual Server)**.
2. The **Virtual Server Mapping** dialog box displays.



For each service you'd like to set up:

1. Use the *Port No.* field to select either the WAN or Async (Serial) port.
2. Enter the IP address supplied by your ISP in the External IP field. If your ISP uses dynamic IP addressing, set this field to 0.0.0.0. Your device will use the dynamically assigned address when connecting to your ISP.
3. Enter the TCP/IP port number for the service that you will be using for IP mapping. Common TCP/IP port numbers are listed below:

   WWW Port 80
   FTP Port 20 or 21
   SMTP Port 25
   POP3 Port 110

   For more information on port numbers, visit http://www.metadigm.co.uk/

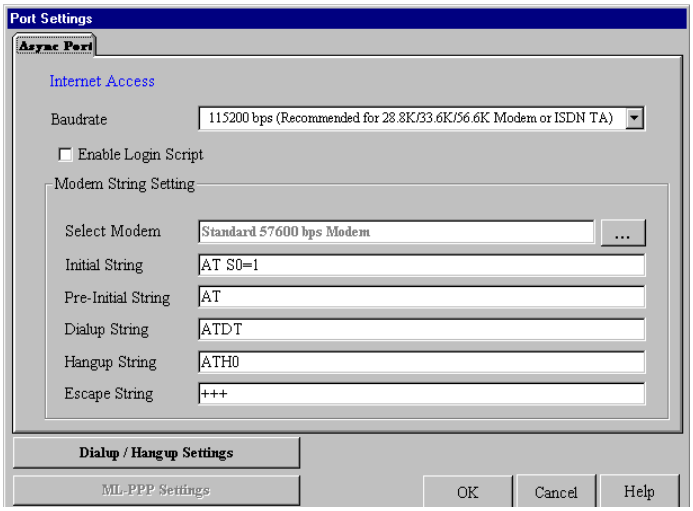
   If you would like to map all services for this external IP address to a computer on your LAN, you can enter port number 0. This means that whenever anyone accesses your external IP address, they will automatically be "mapped" to the internal computer that you specify, regardless of what port number they are using.
4. Enter the Internal IP address of the server to which you want to map the External IP address.
5. Enter the port number for the service that you will be using for this IP mapping.
   Click **Insert** to include the mapping.
6. Click **OK** when you have completed mapping addresses.

   Note: *IP Mapping function allows you to have only one port service on your LAN. For example, if you map an external IP (16.895.1.3) to an internal IP address (192.168.2.22 - a www server), only the internal IP address in your local network can serve as the www.server for the external IP address.*

Port Settings

The Modem Settings options are used to configure the communication between your modem or ISDN TA and your RouteFinder serial port. You must specify the baudrate, modem and modem string settings for your device.

1. To view or change the port settings, from the main **Manager** dialog box, click **Port Settings**. The **Port Settings** dialog box displays.



2. Complete the fields as follows:

   Baudrate:
   Use the list to select the Remote Access DTE speed for your device.

   The absolute maximum setting for a given port on the network device is 4 x the speed of your modem. If the baudrate is set too high, your network device may fail to establish a dial-up connection. For example, if you have a 14.4Kbps modem, the highest speed selected is 57.6Kbs.

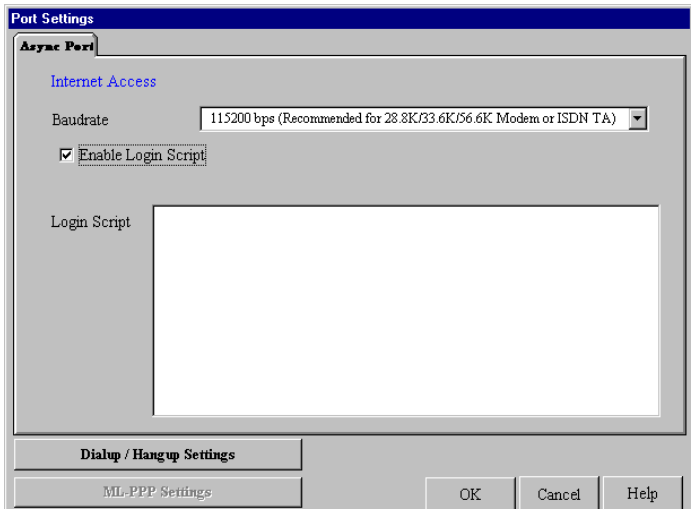
   If your modem does not appear in the list provided, the Standard Modem selection will work in most cases.

   Important: *If you are using an ISDN Terminal Adapter, refer to the Async to Sync PPP string in the User Manual provided with the device to determine the correct initialization, dialup and hang up strings.*

   Note: *Due to variations in ISP connections and phone line quality, this theoretical maximum speed is not attainable. You may need to set the baudrate at a lower speed.*

Edit Login Script for Remote Access

1. From the **Port Settings**, *Async* tab, click **Edit Login Script**.
2. The **login Script** dialog box displays.



A sample remote access login script is shown below. If a remote access client is configured to "bring up a terminal window after dialing", this remote access login script initiates.

For Remote Access, the device will act as the server side...

Send 'Welcome' displays "**Welcome**" to remote site.
Send sends an Enter (Carriage return + line feed) to the remote site.
"**Send Username**" prompts the remote site for a user name.
"**Retrieve 1**" will wait for the remote site to enter the user name that will be used for PPP authentication.
"**Send Password**" prompts the user for a password.
"**Retrieve 2**" will wait for the remote site to enter a password.
"**Verify 3**" instructs the device move to login script line 3 if PPP authentication fails.
"**Go"** means start PPP protocol.

Writing a login script for IP Routing

To write an effective login script, you must obtain the correct login script information from your ISP and become familiar with using the login script commands.

Every ISP has a unique login interface screen. Check with your ISP to determine how your ISP requests information from you when using a PPP connection.

Note: *You can create a simple dial-up connection to view your ISP interface log-in screen using Dial-Up Networking in Windows 95, 98, NT or 2000.*

Some common commands are:

Send and SH	**FUNCTION**
Send 'ATZ'	Resets the Modem
Send 'ATDT 888-1234'	Dials the phone number "888-1234"
Send 'JaneDoe'	Types "JaneDoe" at the ISP interface
SH '1234'	Types "1234" at the ISP interface but displays **** on the RouteFinder monitor to hide the password.
Send ''	Sends Enter (carriage return plus line feed) to the ISP

Wait	**FUNCTION**
Wait 5	The Modem will wait for 5 seconds before moving the next line in the login script.
Wait 'CONNECT'	The Modem will wait for CONNECT to display before moving to the next command.
Wait 'CONNECT 6'	Modem will wait for "CONNECT" to display before moving to the next command. If CONNECT does not display, the modem will go to line 6 of the login script.

Other	**FUNCTION**
Go	Begins PPP
Jump4	Goes back to line 4 of the login script.
Hangup	Hangs up the modem.

Example 1: ***Script for Normal Reliable ISP***

#	**Login Script**	**Meaning of Each Login Script Command**
1	Send'ATZ'	Rests Modem
2	Send'ATS0 =1'	Sends initial string 'ATS0 =1' to modem
3	Send'ATDT888-1234'	Dial phone number 888-1234
4	Wait'CONNECT'	Waits for ISP to send reply 'CONNECT'
5	Wait'username:'	Waits for ISP to send reply 'username'
6	Send'JaneDoe'	Sends the user name 'JaneDoe' to the ISP
7	Wait'password'	Waits for ISP to send reply 'password'
8	SH'1234'	Sends password '1234' to the ISP
9	Wait'===>'	Waits for ISP to send reply '===>'
10	Send'1'	Selects option 1(PPP) for this ISP
11	Go	Starts PPP mode

Example 2 : *Script for Unreliable ISP (Redial until connected)*

#	Login Script	Meaning of Each Login Script Command
1	Send‘ATZ‘	Resets modem
2	Send‘ATS0 =1‘	Sends initial string ‘ATS0 =1‘ to modem
3	Send‘ATDT8881234	Dials phone number 888-1234
4	Wait‘CONNECT‘2	Wait for ISP to send reply ‘CONNECT‘. If no CONNECT, returns to line 2 to re-dial.
5	Wait‘username:‘12	Waits for ISP to send reply ‘username‘. If no response, goes to line 12.
6	Send‘JaneDoe‘	Sends the username ‘JaneDoe‘ to the ISP
7	Wait‘password‘	Waits for ISP to send reply‘ password‘
8	SH‘1234‘	Sends password ‘1234‘ to ISP
9	Wait‘====>‘	Waits for ISP to send reply ‘===>‘
10	Send‘1‘	Selects option 1 (PPP) for this ISP
11	Go	Starts PPP mode
12	Hangup	Hangs up Modem

Example 3 : *Script for Unreliable ISP (2nd ISP backup)*

#	Login Script	Meaning of Each Login Script Command
1	Send‘ATZ‘	Resets modem
2	Send‘ATS0 =1‘	Sends initial string ‘ATS0 =1‘ to modem
3	Send‘ATDT8881234	Dials phone number 888-1234
4	Wait‘CONNECT’ 12	Waits for ISP to send reply ‘CONNECT’. If no reply, goes to line 12 for ISP #2.
5	Wait ‘username:’ 12	Waits for ISP to send reply ‘username’. If no response, goes to line 12 for ISP #2.
6	Send‘JaneDoe‘	Sends the username ‘JaneDoe‘ to ISP
7	Wait‘password‘	Waits for ISP to send reply‘ password‘
8	SH‘1234‘	Sends password ‘1234‘ to ISP
9	Wait‘====>‘	Waits for ISP to send reply ‘===>‘
10	Send‘1‘	Selects option 1 (PPP) for this ISP
11	Go	Starts PPP mode (Rest of script ignored)
12	Hangup	Hangs up Modem
13	Send ‘AT S0=1’	Sends initial string ‘AT SO=1’ to modem
14	Send ‘ATDT 8885678’	Dials phone number 888-5678 (ISP #2)
15	Wait ‘Connect’ 23	Waits for ISP to send reply ‘CONNECT’. If no CONNECT, goes to line 23.
16	Wait ‘username:’ 23	Waits for ISP to send reply ‘username’. If no response, goes to line 23.
17	Send ‘Stephen’	Sends the username ‘Stephen’ to ISP
18	Wait ‘password:’	Waits for the ISP to send ‘password:’
19	SH ‘5678’	Sends password ‘5678’ to ISP
20	Wait‘====>‘	Waits for ISP to send reply ‘===>‘
21	Send‘1‘	Selects option 1 (PPP) for this ISP
22	Go	Starts PPP mode
23	Hangup	Hangs up Modem
24	Jump 2	Goes back to line 2 to re-dial ISP#1

Modem String Settings

The most important modem string is the initialization string because your network device uses it to establish communications with your modem or ISDN TA. The modem initialization string displayed is the modem or ISDN TA initialization string entered in the Setup Wizard. For most analog modems, the Standard Modem selection will work. For additional information, refer to the Modem Settings information presented in the Software Installation and Configuration Chapter of this User Guide.

Important: *There is no standard ISDN TA initialization string. If your ISDN TA is not included in the modem list, check your ISDN TA User's Guide for information for the initialization string for an Asynchronous to Synchronous PPP connection. If you are using only one channel of your ISDN connection, you can enter the Async to Sync PPP initialization string. If you are bundling your connection channels, you'll need to use a Multilink-PPP initialization string. You must also enter the two phone numbers in the Telephone Number field of the* ***General Settings*** *dialog box. Also verify that your ISDN TA supports the dial-up string ATDT. Most ISDN TAs support ATDT, but some support ATD or ATDI.*

Dial-up/Hang-up Settings

The Dial-up/Hang-up settings allow you to specify your connection time (idle timeout or auto reconnect) and the number of times to attempt to connect (if connection cannot be established).

1. From the main **Manager** dialog box, click **Port Settings**.
2. From the *Async* tab, click **Dial-up/Hang-up Settings**.

Individual Port Options

Individual Port Options lets you set the idle-timeout function for each serial port of the RouteFinder. You can set the number of minutes you wish to allow a connection to stay idle before disconnection.

Note: *Default idle timeout for IP Routing is 5 minutes. Default idle timeout for Remote Access is 30 minutes.*

If you un-check the idle-timeout, once a client establishes a connection, the connection will be maintained until you turn off your modem, unplug your network device or use the *Terminate Connection* function in the RouteFinder monitor program.

The Automatic Reconnect (Always connect) essentially maintains your connection (e.g., idle time out = infinite). If the connection is disconnected for any reason, it will automatically attempt to reconnect.

Dial-up Retry Options

The Dial-Up Retry option allows you to specify the number of times the RouteFinder should attempt to establish a connection.

If the retry count is 0, the device will not dial-out to connect to the remote site.

Note: *Automatic Reconnect will override the Retry count setting if retry count is set to 0.*

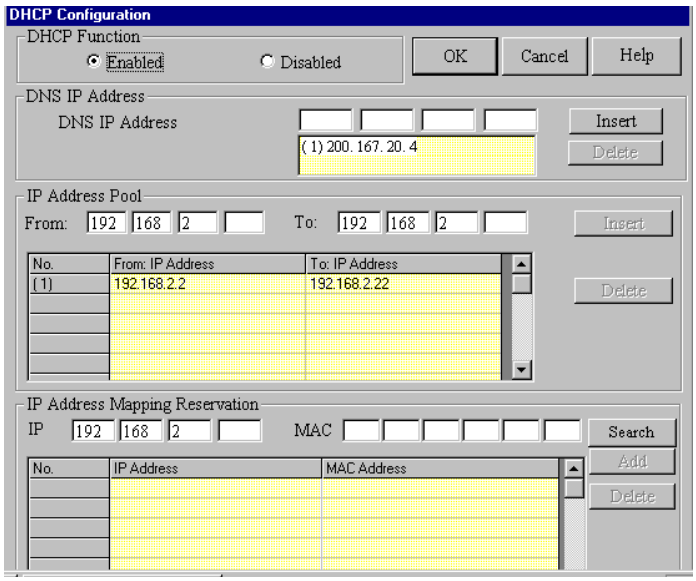
LAN DHCP Server

Note: *Refer to the Glossary at the back of this User Guide for more information about the DHCP function.*

1. From the main **Manager** dialog box, click **LAN DHCP Server**.

   Note: *The LAN DHCP Server option indicates if DHCP is Enabled or Disabled. By default the DHCP function is Enabled. To Disable the function, you must open the DHCP Configuration dialog box, select* ***Disabled*** *and click* ***OK****.*

2. The **DHCP Configuration** dialog box displays.



3. Complete the following information:

   DNS IP Address:
   Enter the ISP's DNS IP address. You may enter up to 4 ISP DNS IP addresses. Click **Insert**.

   IP Address Pool:
   The IP Address Pool contains the range of IP addresses that will be automatically assigned to the clients of your network as they connect to the network.

   Note: *By default, the IP address pool range is from 100 to 200. Ranges are listed in the IP Address Pool table.*

   To *change* the range:
   1. Select the existing range of addresses.
   2. Enter a new range.
   3. Press **Insert**.

   To *delete* an IP Address range:
   1. Select the range of addresses.
   2. Press **Delete**.

   IP Address Mapping Reservation:
   You can use the IP Address Mapping Reservation option to give a *static* IP address to particular computers on your network. Each time a computer is powered on and connects to the network, it will receive the same IP address. Static IP addresses are frequently assigned to network resources such as printers, servers, hubs and routers that are consistently shared by network clients.

To assign a static IP Address:
Enter the MAC address manually or use the MAC address search tool.

To use the MAC address search tool:
1. Enter the IP address of the computer.
2. Click **Search** to find the MAC address.
3. Once the address has been located, click **Add** to reserve the address.

To delete a static IP Address:
1. Select the static address you would like to delete.
2. Click **Delete**.

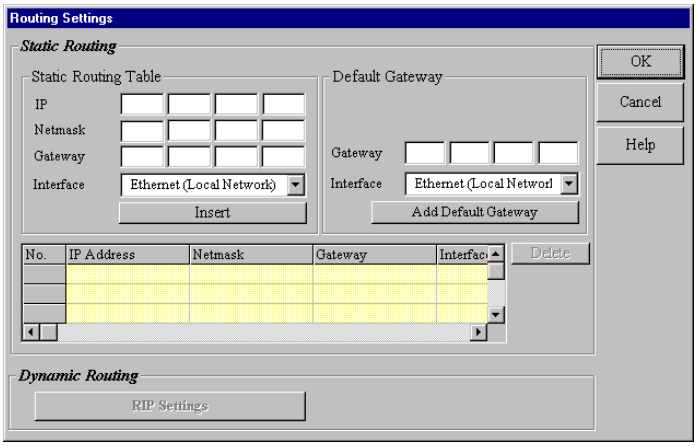
Note: *Refer to the User Guide Glossary for information about determining a computer's netmask address.*

Routing Settings

Routing is the process of moving a packet of data from source to destination. The RF500S acts as a router to enable messages to pass from one computer to another and eventually reach the target machine. Part of this process involves analyzing a *routing table* to determine the best path. Use the information below to create a routing table to connect your network to another network, or to connect subnets within your network.

Note: *A routing table is required to use the LAN -to- LAN routing function of the RF500S.*

1. From the main **Manager** dialog box, select **Routing Settings**.
2. The **Routing Settings** dialog box displays.



Static Routing

For each different subnet on your LAN, enter:

IP: Enter the (network/subnet) IP address to which you want to route.

Netmask: Enter the subnet mask of your Network IP address.

Gateway: Enter the IP address of the gateway device linking your network to the other network/subnet. The IP address should be in the same subnet as your RF500S. If you are using this device with the LAN -to- LAN function, the gateway IP should be set as the IP address of the RouteFinder.

Interface: Select the port (LAN or WAN, etc.) that the routed packet should pass through. Select *Local Network* if you are using a separate router. If you are using the RF500S with the LAN -to- LAN function, the Interface should be set as the WAN port that connects you to the other subnet.

Click **Insert** to save the information to the routing table.

To delete this information, select it from the routing table and click **Delete.**

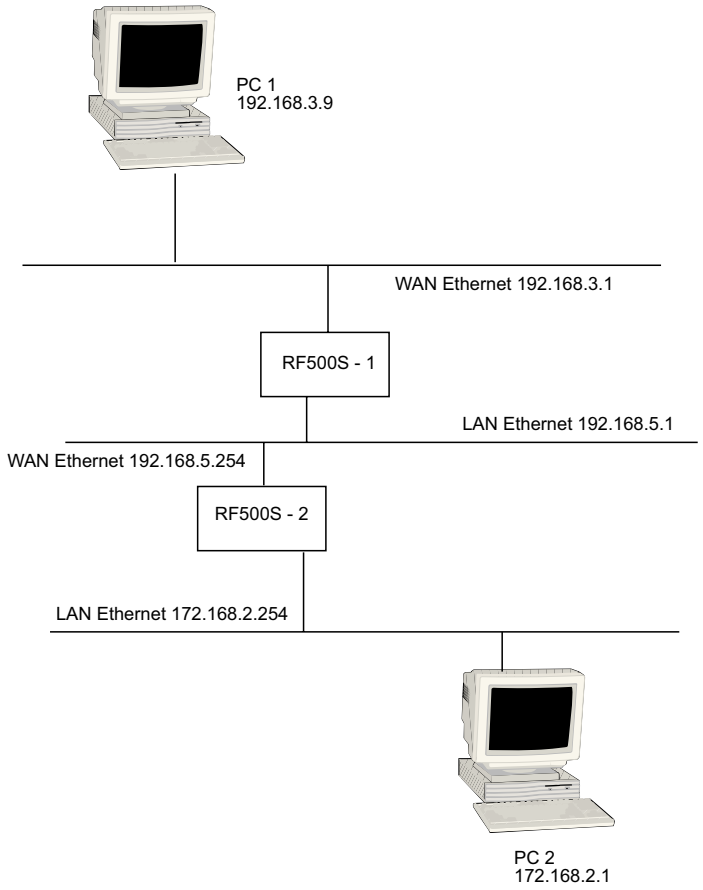
Default Gateway: Default gateway is an IP address that all packets are routed to, when the device is unable to find a route match (the destination IP address of the packet in the routing table).

Click **Add Default Gateway** to save the IP address of the default gateway.

Interface: Select the port (LAN or WAN, etc.) interface where the gateway is located.

Routing Table

The routing table stores the routing information so that the RF500S knows how to route the IP packets to the proper network.



What is the purpose of the routing table?
In the diagram above, the RF500S-1 has the routing information to route between 192.168.3.x and 192.168.5.x. The device does not have the information about how to route to the 172.168.2.x network. If you want the RF500S-1 to route to 172.168.2.x, you must add the following information to the routing table:

IP: 172.168.2.0
Network: 255.255.255.0
Gateway IP: 192.168.5.254
Interface: Ethernet (Local Network)

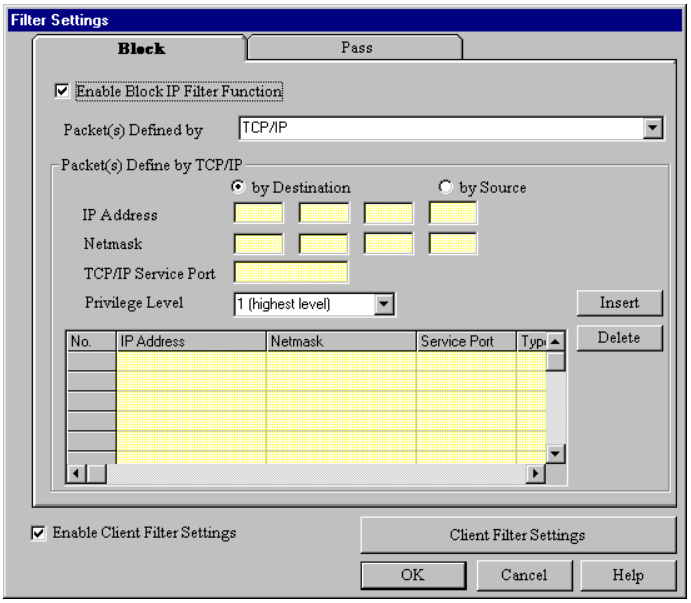
If you would like the RF500S-2. to route to 192.168.3.x, enter the following routing table information into the RF500S Routing settings:

IP: 192.168.3.0
Network: 255.255.255.0
Gateway IP: 192.168.5.1
Interface: WAN Ethernet

Filter Settings

You can use Filter Settings to choose which packets are allowed to enter the network and which packets will be blocked. Filter Settings can be used to filter network services such as Mail, WWW, FTP, Telnet and News.

1. From the main **Manager** dialog box, select your RF500S, then **Filter Settings**.
2. The **Filter Settings** dialog box displays.



3. Select the *Block* tab or the *Pass* tab to define your filtering.

   • The Block function filters by blocking packets from going *out* the WAN port or coming *in* through the LAN port. To enable the Block IP filter function, select **Enable Block IP Filter Function**.

   • The Pass function filters by defining which packets can go *into* your WAN port or come on to your LAN. To enable the Pass IP filter function, click the ***Pass*** tab and select **Enable Pass IP Filter Function**.

4. To filter packets to be passed or blocked, use the **Packets Defined** by list to select *TCP/IP* or *User*.

   Packets Defined by TCP/IP:
   If you choose to define by TCP/IP, you must enter the IP information of the packet(s), then select either *By Destination* or *By Source*.

   IP Address:
   Enter the IP address of the packet to be blocked or allowed to Pass. Keep in mind the option that you've checked, either *By Destination,* (enter the IP address of the device to which the packet is going) or *By Source,* (enter the IP address of the device to which the packet is coming from).

   Netmask:
   Enter the subnet mask for the packet.

   TCP/IP Service Port:
   Enter the Socket Port you would like to block or allow to pass (e.g., HTTP= 80)

Privilege Level

Use the Privilege list box to select an appropriate level for this filter.

It is common to set many filter rules for a particular client. At times, the rules you have set may conflict with one another. When a conflict occurs, the filter with the higher privilege level will override the other filter(s).

Note: *Level one is the highest level, level sixteen is the lowest privilege level.*

Example:
Let's say you configure a filter rule for **Source** IP address 192.168.100.72 with a privilege level of 16 to **Pass** using socket number 80. At the same time, you set the same filter rule to block IP Address 192.168.100.72 with a privilege level of one. The RF500S will implement the filter to block the IP address 192.168.100.72 because the privilege level is higher.

Note: *If conflicting rules have the same privilege level, then the RF500S will block the packet.*

Click **Insert** to add each IP address to the list.

To remove a defined packet, select the packet you'd like to delete from the table and click **Delete**.

Packets defined by User:

If you choose to define by User, you must define the byte pattern of the packet(s). The RF500S uses the defined byte patterns to block or pass packets from the WAN or from the LAN.

1. In the *Block* dialog box, select **Enable Block User Defined Pattern Function**.

2. In the *Packets defined by User* field, select **From LAN** or **From WAN**.

Starting from which byte number:
In this field, indicate the first byte in the packet the RF500S should read to determine if the byte pattern (in Hex) is one that should be filtered. Exclude the PPP header. Start from byte 0 of the network protocol.

Byte Pattern (in Hex):
Enter the packet byte pattern that you would like the RF500S to recognize as a packet to be filtered. (Block/Pass from the WAN to the LAN). The maximum pattern size is 12 bytes.

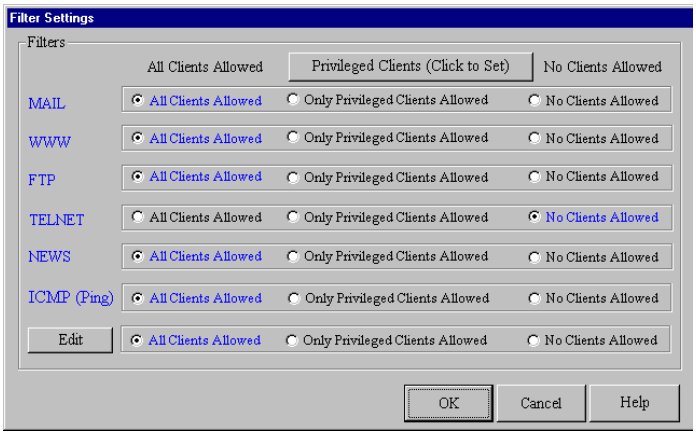
Click **Insert** to add each byte pattern to the table.

To delete a defined packet, select the packet in the table and click **Delete**.

Enable Client Filter Settings

The *Client Filter* allows you to decide which services are allowed into your network and which clients are authorized to access them.

1. From the **Filter Settings** dialog box, select **Enable Client Filter Setting**.
2. Click **Client Filter Settings**.
3. The **Filter Settings** dialog box displays.



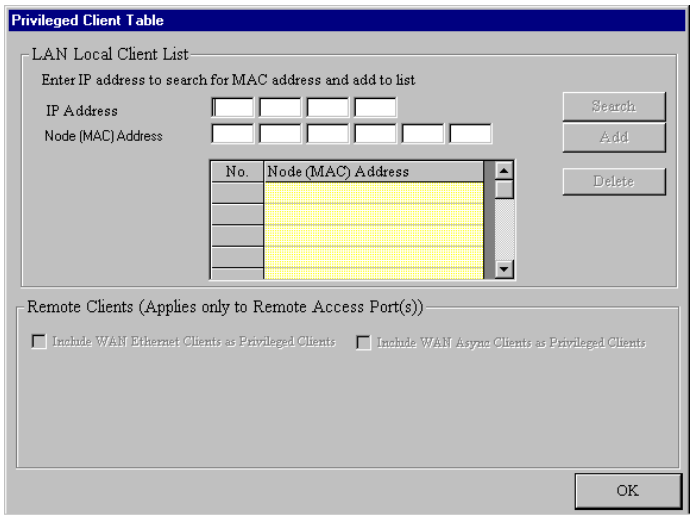
The filter works by filtering TCP/IP port numbers. The 5 most commonly used port numbers are listed for you. They include the port numbers for Mail, WWW, FTP, Telnet and News. If you would like to filter other services, you must know the port number for the service.

4. Click **Edit** to enter new service port numbers.
5. Enter the **TCP/UDP Port Number** and click **Add**.

   Note: *Refer to the Glossary of the User Guide for a definition of Port.*

6. Click **Privileged Clients**.

7. The **Privileged Client Table** dialog box displays.



LAN Local Client List
In the Privileged Client Table, enter the clients you wish to have privileged access to the services that you have selected in the **Filter Settings** dialog box. The filter uses MAC addresses to identify the privileged clients. You can enter the MAC address directly or you can use the MAC address search tool by entering the IP address of the computer, then using the Search button to find the MAC address.

After completing the IP Address and MAC (Node) address, click **Add** to include the information in the Node (MAC) address list.

Remote Clients
(Applies to Remote Access Port(s))
Select **Include WAN Async Clients as Privileged Clients** or **Include WAN Ethernet Clients as privileged clients** to filter Remote Clients by the port they are coming in through.

8. Click **OK** when complete.

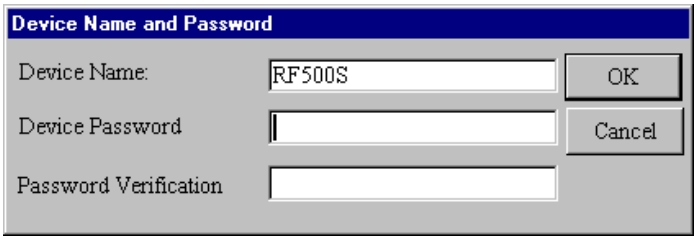
Refresh Device List

1. From the main **Manager** dialog box, click **Refresh Device List** to search the LAN for available network devices and display them in the **Available Devices** list.

   Note: *If a device does not appear in the list, click* ***Refresh Device List*** *again to determine if the device will appear on the list. If the device still does not appear, ensure that all cables are correctly connected and that the RF500S is powered on. If the device still does not appear in the list, refer to the Troubleshooing chapter of this User Guide.*

Device Name and Password

1. From the main **Manager** dialog box, click **Device Name and Password**. You may use the default device name or use this dialog box to change the name or add a password for your device.



Device Name:
This field displays the name of your network device. To change the name, simply enter a new name in the field. If you are connecting to an ISP via cable modem or DSL, and your ISP requires you to enter a computer name, you may use the device name that you've entered on this screen.

Device Password:
The RouteFinder manager does not come with a password enabled. If you choose to provide the device with a password, you will be prompted to enter the password each time you want to configure your network device. To enter a Password, type your password in the Device Password field, then re-enter your password in the Password Verification field.

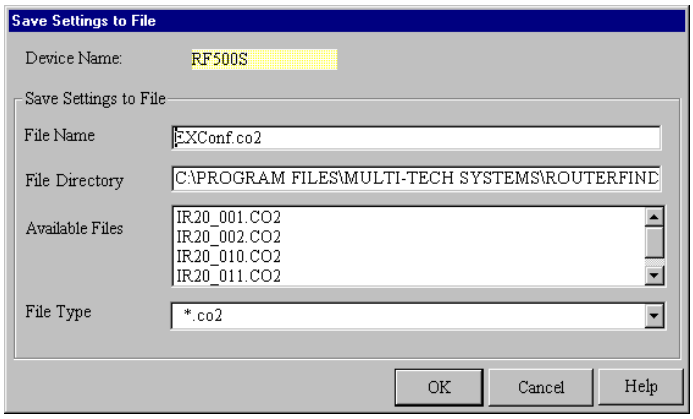
Note: *If you choose to use a password, ensure you have selected something that will be easy to remember or write it down and store it in a safe location. If you have completely forgotten your password, contact the Multi-Tech Technical Support group for assistance. Refer to Chapter 10 in this User Guide for more information about our Technical Support services.*

2. Click **OK**.

Save Settings to File

The **Save Settings to File** option allows you to save your settings to a file. This option provides a method for backing up your system configuration so that it can be used in the event your settings become accidently deleted. This option can also be used if you would like to have more than one set of settings for your RouteFinder.

1. From the main **Manager** dialog box, click **Save Settings to File**.
2. The **Save Settings to File** dialog box displays.



To save your settings to a file:

1. In the **File Name** field, enter a name for your file.

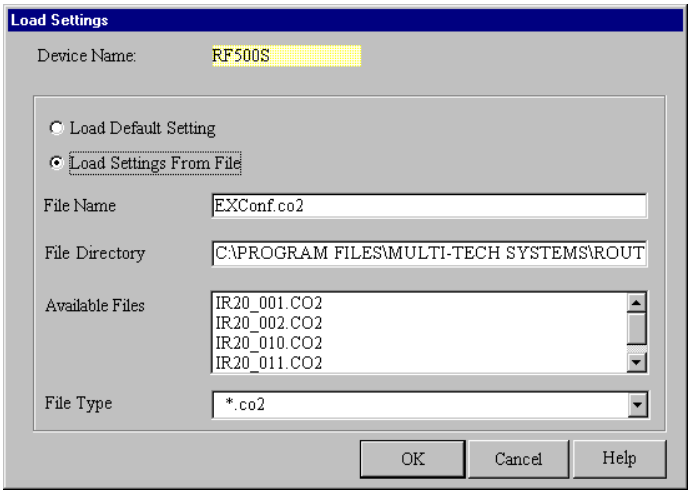
   Note: *Do not change the file type extension. If you try to use the Load Settings function, the manager program will look for the specific file extension compatible with your device. For example, *.co1 is used only for 1 WAN port units, *.co2 is used only for 2 WAN port units.*

2. The File Directory field displays the default path to the configuration files. You may save a copy of the file to a different location by changing the path in the File Directory field.
3. Press **OK** to save the settings to the file name specified in step 1.

Load Settings

The Load Settings option allows you to load either the default settings of your network device or to load settings previously saved to a file.

1. From the main **Manager** dialog box, click **Load Settings**.
2. The **Load Settings** dialog box displays.



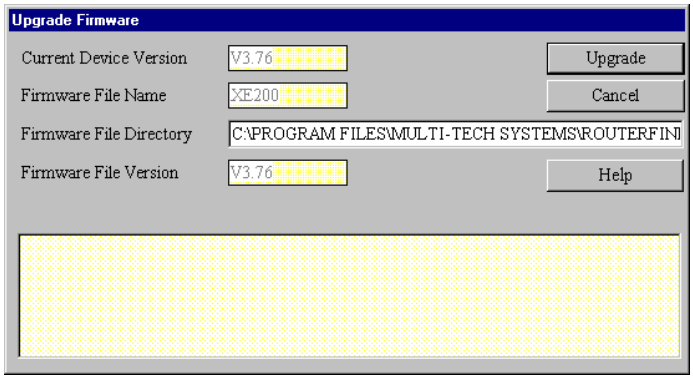
3. To return the RouteFinder to factory default settings, select **Load Default Setting**.
4. To load a configuration from a file, select **Load Settings From File**.
   - In the **File Name** field, enter the name of the file containing the settings you would like to use .
   - Indicate the location of the file by entering the full path to the file in the **File Directory** field.
   - **Select** the file from the *Available Files* table.
5. Press **OK** to load and apply the settings to the RouteFinder.

Upgrade Firmware

Warning: *Upgrade the firmware of your RouteFinder RF500S only under the advice and direction of the Multi-Tech Technical Support Group. Improperly upgrading the RF500S may disable the device!*

The Upgrade Firmware options allow you to upgrade your RF500S firmware. The Upgrade Firmware option upgrades the firmware of your RF500S, not the RouteFinder Manager or Monitor software.

1. From the main **Manager** dialog box, click **Upgrade Firmware**.
2. The **Upgrade Firmware** dialog box displays.



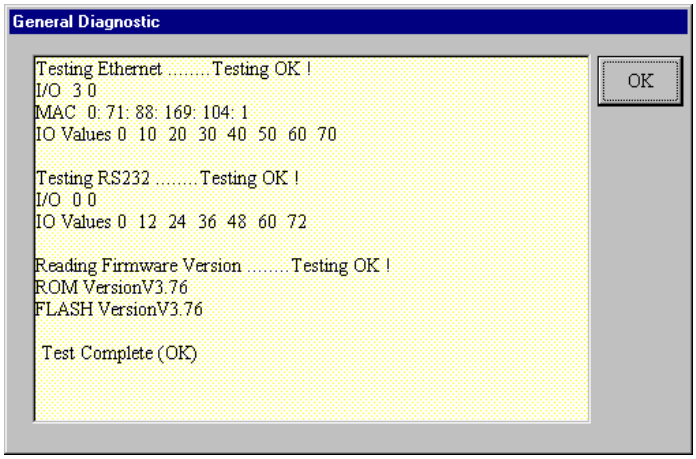
To Upgrade your firmware:

1. Download the latest firmware from the Multi-Tech System's web site at www.multitech.com.
2. Copy the firmware to the directory containing the RouteFinder Manager program files. Refer to the default Firmware File Directory field to determine the location of the files on your system.
3. Enter the location of the new firmware file in the **Firmware File Directory** field. RouteFinder Manager will automatically detect the new firmware file name and display it in the *Firmware File Name* field. The version number of your firmware will display in the *Firmware File Version* field.
4. Click **Upgrade** to upgrade your firmware.
5. A message appears stating the upgrade has started.
6. After several minutes, an informational dialog box displays indicating the upgrade was successful.
7. Click **OK**.
8. From the main **Manager** dialog box, click **Save and Exit**.
9. Click **Yes** to restart the RouteFinder using the new firmware version.

General Diagnostic

The General Diagnostic option on the main RouteFinder Manager dialog box displays network device information and allows you to determine if the RF500S is functioning properly.

1. From the main **Manager** dialog box, click **General Diagnostic**.
2. The **General Diagnostic** dialog box displays information about the RF500S.


General Diagnostic
Testing Ethernet .....Testing OK !
I/O 3 0
MAC 0: 71: 88: 169: 104: 1
IO Values 0 10 20 30 40 50 60 70
Testing RS232 .....Testing OK !
I/O 0 0
IO Values 0 12 24 36 48 60 72
Reading Firmware Version .....Testing OK !
ROM VersionV3.76
FLASH VersionV3.76
Test Complete (OK)
OK

3. Record the information if necessary and click **OK** to exit.

RouteFinder™

Chapter 6 - RouteFinder Monitor

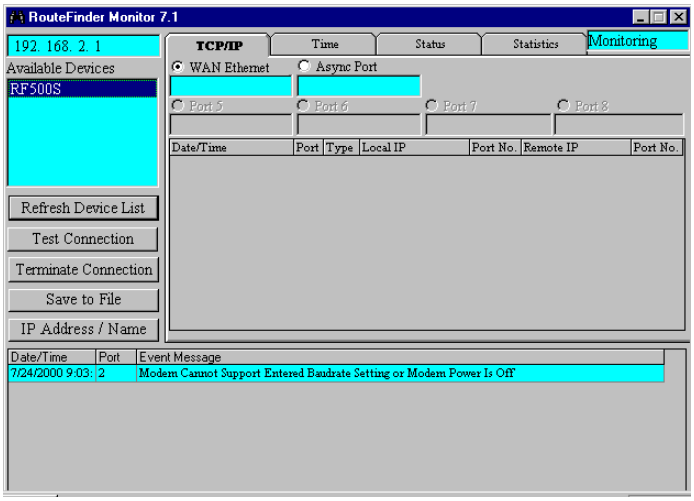
MultiTech® Systems

RouteFinder Monitor

RouteFinder Monitor is a utility that provides both monitoring and troubleshooting functions.

Running RouteFinder Monitor

1. Click on the RouteFinder Monitor icon, or select **Start | Programs | RouteFinder Manager | RouteFinder Monitor**.
2. The **RouteFinder Monitor** dialog box displays.



Note: *If you receive a message stating "Device is not found", refer to the Troubleshooting chapter in this User Guide.*

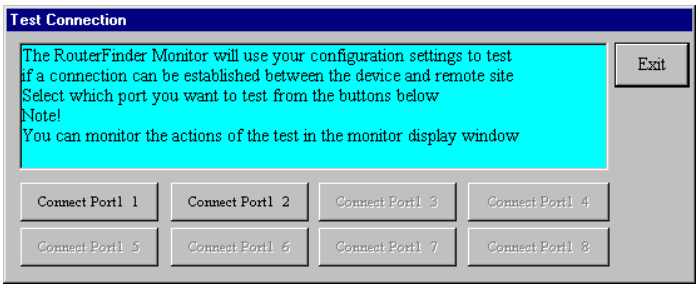
Refresh Device List

Click **Refresh Device List** from the main **RouteFinder Monitor** dialog box to display a list of network devices in the **Available Devices** window.

Test Connection

The **Test Connection** option tests your connection settings and assist you in determining if problems are due to the modem, the RouteFinder, or an incorrect setting. Test Connection uses the attached modem(s) to dial-up the remote server (ISP) and establish a connection.

1. From the main RouteMonitor dialog box, click **Test Connection** to begin testing.
2. The **Test Connection** dialog box displays.

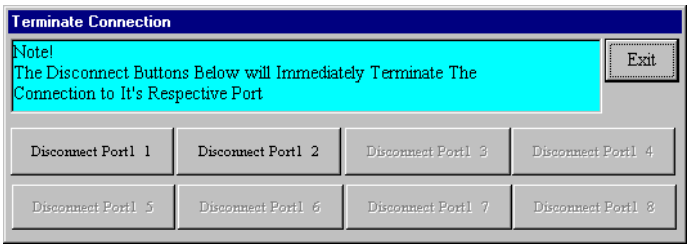

Test Connection
The RouterFinder Monitor will use your configuration settings to test
if a connection can be established between the device and remote site
Select which port you want to test from the buttons below
Note!
You can monitor the actions of the test in the monitor display window
Exit
Connect Port1 1
Connect Port1 2
Connect Port1 3
Connect Port1 4
Connect Port1 5
Connect Port1 6
Connect Port1 7
Connect Port1 8

3. Select *Connect Port 1* to test the WAN connection, or *Connect Port 2* to test the Async connection.
4. The monitor display window displays the actions of the test.
5. To terminate the connection, refer to the **Terminate Connection** instructions which follow.
6. Click **Exit** to close the Test Connection dialog box.

Terminate Connection

The **Terminate Connection** option is designed to allow the Network Administrator to terminate an RF500S connection instantly.

1. From the main **RouteFinder Monitor** dialog box, select **Terminate Connection**.
2. The **Terminate Connection** dialog box displays.

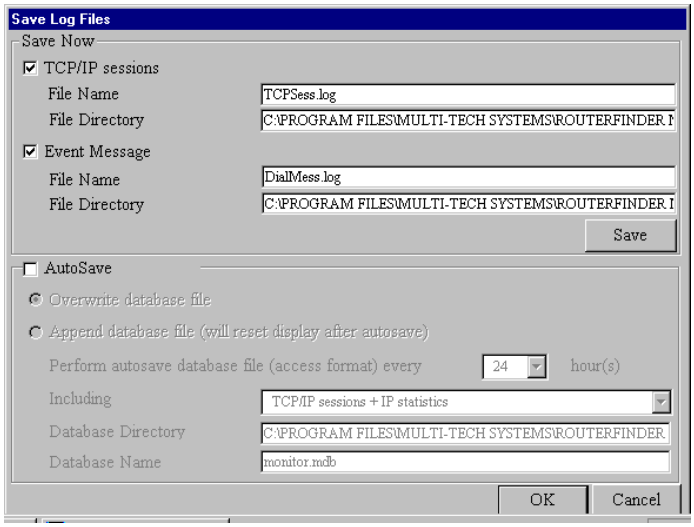


3. **Select** *Disconnect Port 1* or *Disconnect Port 2*.
4. Click **Terminate Connection**.
5. Click **Exit** to return to the **RouteFinder Monitor** dialog box.

Save to File

Click **Save to a File** to save a monitoring session to a file. This feature can be used to create an event log to send to our Technical Support group for evaluation.

1. From the main **RouteFinder Monitor** dialog box, select **Save to File**.
2. The **Save Log Files** dialog box displays.



Save Now

If you want to save the monitor display at any point in time, select the monitor you'd like to save to a file (TCP/IP, Event Message, etc.). Select the *File Name* and *File Directory* to which you'd like to save the file and click **Save**.

Autosave

If you wish to automatically save the information displayed on the monitor to a database file, enable the AutoSave function. Options for this function include:

Overwrite database file
This option saves the information collected by the monitor to a database file based on the time interval that you specify, overwriting the last saved database file.

Append Database file
This option saves the information collected by the monitor to a database file based on the time interval that you specify, updating and appending to the file.

Note: *The Append Database file option will reset the monitor and clear the screens after the autosave has appended the information to the file.*

Warning: *The database size limit is equal to the amount of available disk space. Use this option with caution!*

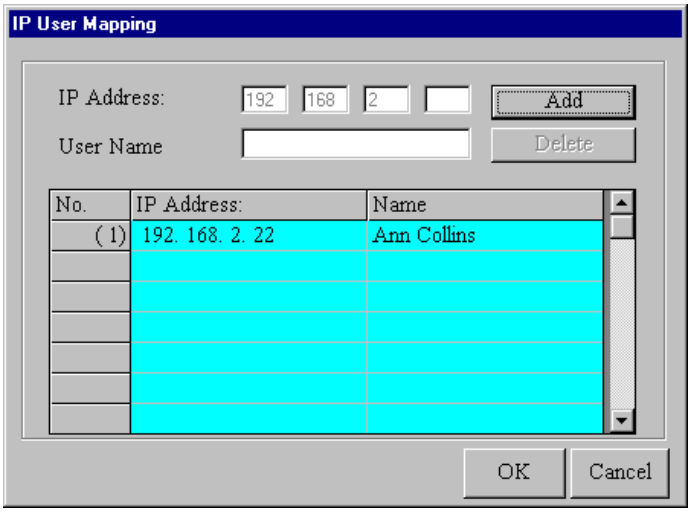
3. Click **OK** when complete.

IP Address/Name

The IP Address/Name function allows you to associate a name with a particular IP address and name on your network. This information will appear in the relevant monitor displays. The IP Address/Name option is used to assist the Network Administrator in determining which users are transmitting and receiving data without having to remember their specific IP addresses.

Each computer listed must have a fixed IP address for your network. You may configure a fixed IP address on the individual computer or use the RF500S's DHCP server IP reservation system (refer to the LAN DHCP section of RouteFinder Manager chapter of this User Guide).

1. From the main **RouteFinder Monitor** dialog box, click **IP Address/Name.**
2. The **IP User Mapping** dialog box displays.



3. Enter each computer's IP Address and associated User Name in the provided fields.
4. Click **Add** after each IP address and name have been added to the list.
5. When all addresses have been added, click **OK**.

Event Messages

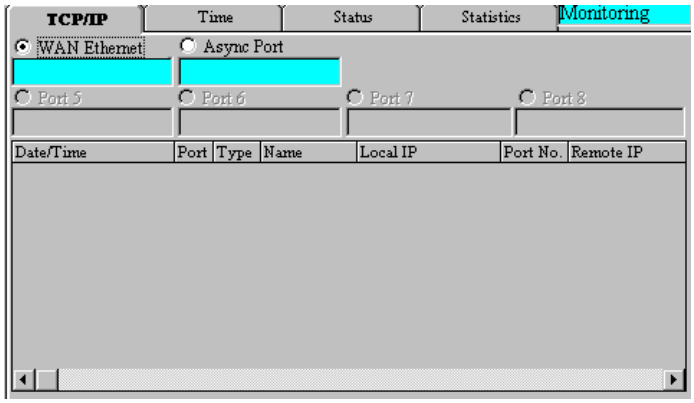
Event Messages are displayed in the lower half of the **RouteFinder Monitor** display. Event Messages provide information about the communication occurring between your network device, ISDN TA/modem and the remote server (ISP).

To assist you in troubleshooting, you may point and click on any event message to bring up a help screen.

TCP/IP Tab

The TCP/IP tab displays all TCP/IP requests made by your network device. You may select to view TCP/IP sessions for the *WAN Ethernet* or the *Async Port*.

1. The *TCP/IP* tab is the default tab displayed in the **RouteFinder Monitor** dialog box. If it is not displayed, click the *TCP/IP* tab.



Note: *The TCP/IP sessions displays the history of the TCP/IP session through the selected port. The TCP/IP information presented does not represent the current status of the TCP/IP session.*

The TCP/IP tab displays the following information:

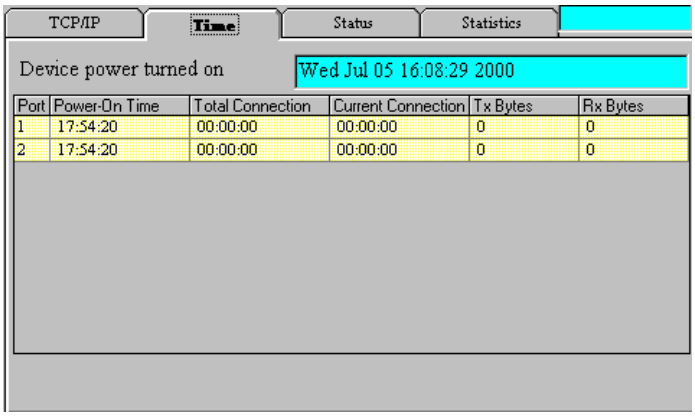
Date/Time:	Indicates the date the request was made.
Port:	Indicates the port you are viewing.
Type:	Displays the type of request being made.
Local IP:	Indicates which IP address you have requested information from.
Remote IP:	Indicates which IP address was requested.
Port Number:	Indicates which TCP/IP port was requested.

2. To **Exit** RouteFinder Monitor, close the window.

Time Tab

The Time Tab provides information about the amount of time the device has been powered on, the total connection time, the current connection time and the amount of data transferred and received.

1. From the main **RouteFinder Monitor** dialog box, click the *Time* tab.
2. The *Time* tab displays information for each port.



Device Power Turned On:
This field displays the time/date that your RF500S was powered on.

Power -On- Time:
This field displays the total time that has elapsed since your RouteFinder was powered on.

Total Connection Time:
This field displays the total connection time for each port that has been logged on since the RouteFinder was powered on.

Current Connection:
This field displays the time that has elapsed since the current connection was established for the port.

TX Bytes:
This field displays the total number of bytes transmitted for each port since your RouteFinder was last powered on.

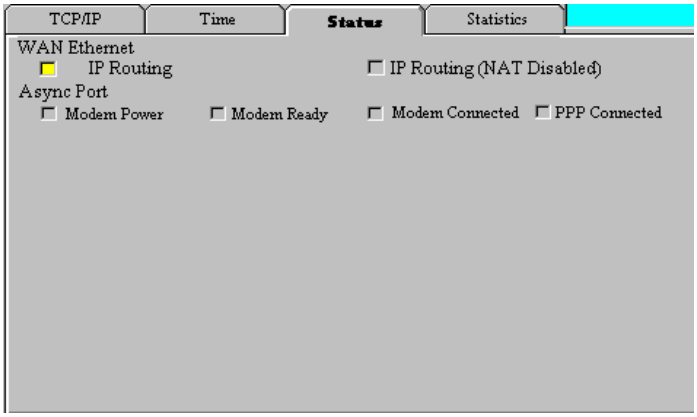
RX Bytes:
This field displays the total number of bytes received for each port since your RouteFinder was last powered on.

3. To **Exit** RouteFinder Monitor, close the window.

Status Tab

The *Status* tab provides information about the status of the *WAN Ethernet* and *Async* ports.

1. From the **RouteFinder Monitor** dialog box, click the *Status* tab.
2. The *Status* tab information displays:



WAN Ethernet:
This indicator light shows that either the **IP Routing** or the **Remote Access** function is in use.

Async Port
Modem Power:
The indicator light is lit when the modem power is turned on.

Modem Ready:
The Network Device sends a pre-initialization and initialization command to the modem or ISDN TA. If this communication is successful, the indicator light will be lit, indicating your modem is ready to make a connection.

Modem Connected:
If the Network Device has detected that your modem has successfully dialed up a connection to a remote site, the indicator light will be lit.

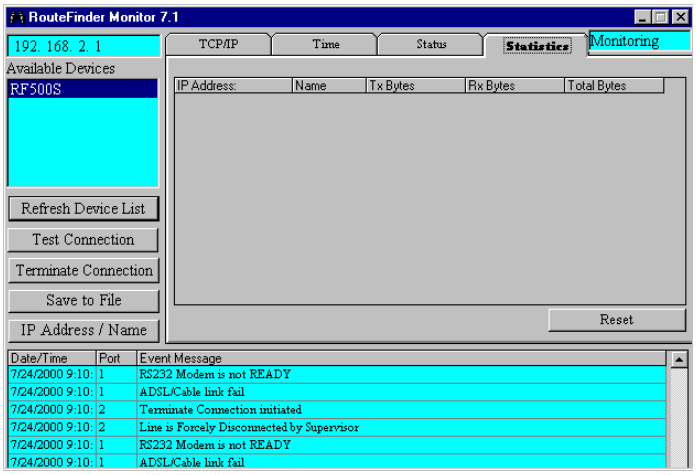
PPP Connected:
After a connection is established, if the RouteFinder has detected that the PPP connection is successful, this indicator light will be lit.

3. To **Exit** RouteFinder Monitor, close the window.

Statistics Tab

The Statistics tab indicates, by port, how many bytes of data have come in and out through the RouteFinder..

1. From the **RouteFinder Monitor** dialog box, click the *Statistics* tab.
2. The *Statistics* tab dialog box displays:



3. You may view the following information:

   IP Address:
   The IP address of the network device.

   Name:
   The Name as entered in the IP/Address name option of the Main RouteFinder Monitor dialog box.

   Tx Bytes:
   Displays the number of bytes transmitted from the computer with this IP address.

   Rx Bytes:
   Displays the number of bytes received from the computer with this IP address.

   Total Bytes:
   Displays the total number of bytes received and transmitted from the computer with this IP address.

4. Use the Reset button to set the IP statistics to zero.
5. To **Exit** RouteFinder Monitor, close the window.

RouteFinder™

Chapter 7 - LAN Client Settings

MultiTech® Systems

LAN Client Settings

In order for a computer to access the Internet, the TCP/IP protocol must be installed on the computer. Computers on your local LAN as well as computers dialing in to your network may use dynamic or static IP addresses. Dynamic IP addresses may be automatically assigned by the DHCP function of the RF500S or another DHCP server. Static IP addresses can either be reserved from the DHCP server or manually configured on the individual workstation.

To install or verify that TCP/IP is installed on your workstations, click **Start** | **Settings** | **Control Panel**, click **Network**, then view the **Protocol** information. If the TCP/IP protocol is not installed on your workstations, you must add it. Refer to the *Adding TCP/IP* section in the following pages, or your Windows documentation for assistance in adding the protocol.

The default setting in Windows is to have IP information (IP Address, DNS Server IP address and Gateway IP address) automatically assigned by a DHCP server such as the one built-in to your RouteFinder.

If you'd like to manually configure the IP addresses on your workstation, you will need to provide an IP address and subnet mask (the local LAN IP address and subnet you want to assign to the individual computer), a Gateway address (the local LAN IP address of your RouteFinder) and a DNS Server address (the DNS IP address provided by your ISP).

Warning: *As a general rule, you should have only one DHCP server working on your network. If you decide to use a DHCP server other than that provided with your RouteFinder, you should use RouteFinder Manager to disable the DHCP LAN Server function. You should also set your RouteFinder's IP address as the gateway to the other DHCP server.*

Setting up Remote Access Clients

Dial-in connections to Windows NT, Novell and Unix servers require slightly different configurations. This section discusses the settings necessary to connect a Windows 95/98/NT/2000 workstation to these various servers.

Note: *the Windows 2000 operating system has a Network Connection Wizard for making new connections, shown on the last page of this section.*

The basic process consists of installing a dial-up adapter and a network protocol. Then, depending on the server to which you are connecting, you will likely need to install client software and specify the particular services you would like to use.

Accessing a Windows NT Server

Windows NT Server combines the best aspects of an application server, a file and printer server, a communications server, and a Web server, and its interoperability and management features make it an excellent network operating system (NOS) for organizations, whether they have mixed computing environments or operate entirely on Windows NT Server. Perform the following procedures when you need to connect your PC workstation to a remote Windows NT Server.

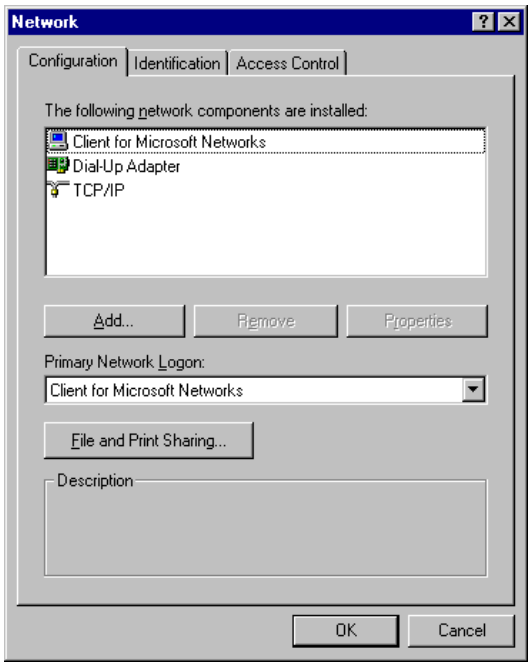
Adding the dial-up adapter (NT Server Connection):

Windows 95/98:

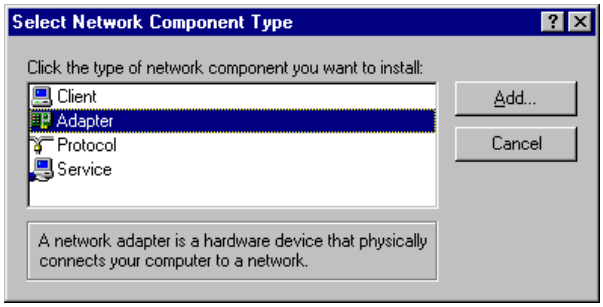
1. Click **Start** | **Settings** | **Control Panel**.
2. Double-click the *Network* icon to open the **Network** dialog box.

Win95

Win98

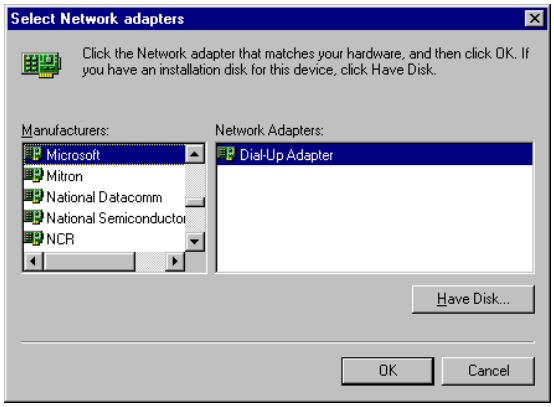


3. Click **Add**; the **Select Network Component Type** dialog box opens.



4. Select (i.e., highlight) **Adapter**, then click **Add**. The **Select Network adapters** dialog box opens.

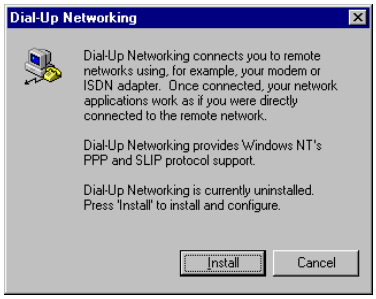
Win95/98



5. In the *Manufacturer*s option box, select **Microsoft**. In the *Network Adapter*s option box select **Dial-up adapter**.
6. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Windows NT:
Dial-up Networking adds PPP and SLIP protocol support, enabling your workstation to gain access to a remote computer or network, even if your computer is not on a network.

1. Double-click **My Computer**, then double-click **Dial-Up Networking**. The following screen is displayed:


Dial-Up Networking
Dial-Up Networking connects you to remote networks using, for example, your modem or ISDN adapter. Once connected, your network applications work as if you were directly connected to the remote network.
Dial-Up Networking provides Windows NT's PPP and SLIP protocol support.
Dial-Up Networking is currently uninstalled. Press 'Install' to install and configure.
Install
Cancel

2. Click **Install**, then follow the onscreen instructions to configure your connection.

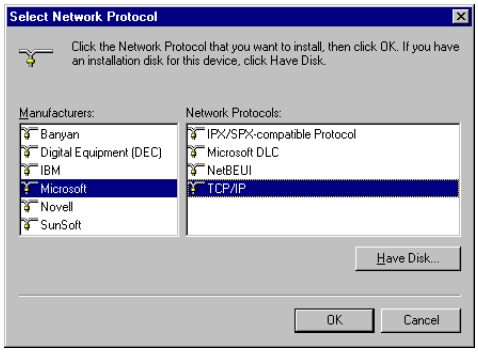
Adding TCP/IP (NT Server Connection):

Windows 95/98/NT:

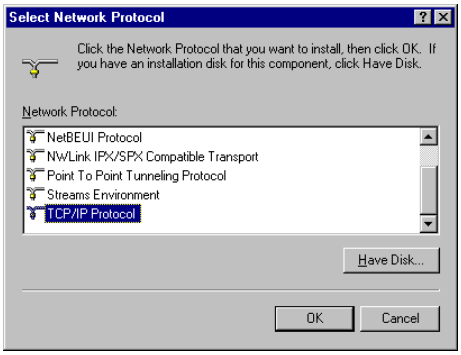
1. In the **Network** dialog box, *Configuration* tab, click **Add**.
2. Select **Protocol** and click **Add**.
3. The **Select Network Protocol** dialog box is displayed. In the *Manufacturers* option box [Win95 only], select **Microsoft**. In the **Network Protocols** option box, select **TCP/IP** [Win95/98] or **TCP/IP Protocol** [WinNT only].

   [**Note:** Windows NT workstation has no *Manufacturers* option box.]

Win95/98



WinNT

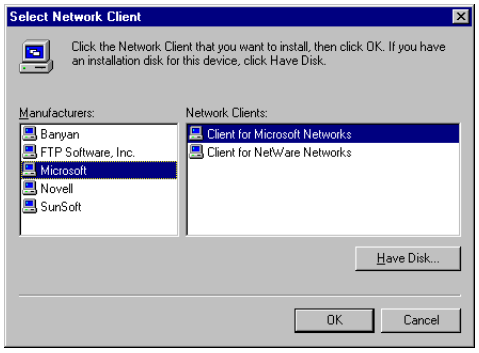

Select Network Protocol
Click the Network Protocol that you want to install, then click OK. If you have an installation disk for this component, click Have Disk.
Network Protocol:
NetBEUI Protocol
NWLink IPX/SPX Compatible Transport
Point To Point Tunneling Protocol
Streams Environment
TCP/IP Protocol
Have Disk...
OK
Cancel

4. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Adding Client for Microsoft Networks (NT Server Connection):

Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, click **Add**.
2. Select **Network Client** and click **Add**.
3. The **Select Network Client** dialog box displays. In the **Manufacturer's** option box, select **Microsoft**. In the **Network Clients** option box, select **Client for Microsoft Networks**.



4. Click **OK** to add this Client and return to the **Network** dialog box.

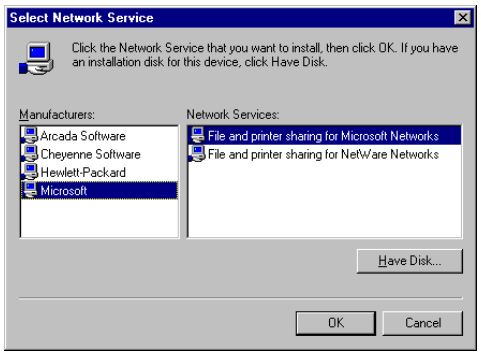
Adding File and Print Sharing for Microsoft Networks (NT Server Connection):

Windows 95/98:

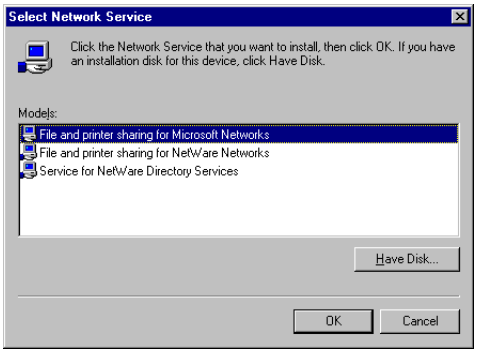
1. In the **Network** dialog box, *Configuration* tab, click **Add**.
2. Select **Services** and click **Add**.
3. The **Select Network Service** dialog box displays. In the *Manufacturers* option box, select **Microsoft**. Select **File and Printer sharing for Microsoft Networks.**

   [**Note:** Windows 98 has no *Manufacturers* option box.]

Win95


Select Network Service
Click the Network Service that you want to install, then click OK. If you have an installation disk for this device, click Have Disk.
Manufacturers:
Arcada Software
Cheyenne Software
Hewlett-Packard
Microsoft
Network Services:
File and printer sharing for Microsoft Networks
File and printer sharing for NetWare Networks
Have Disk...
OK
Cancel

Win98

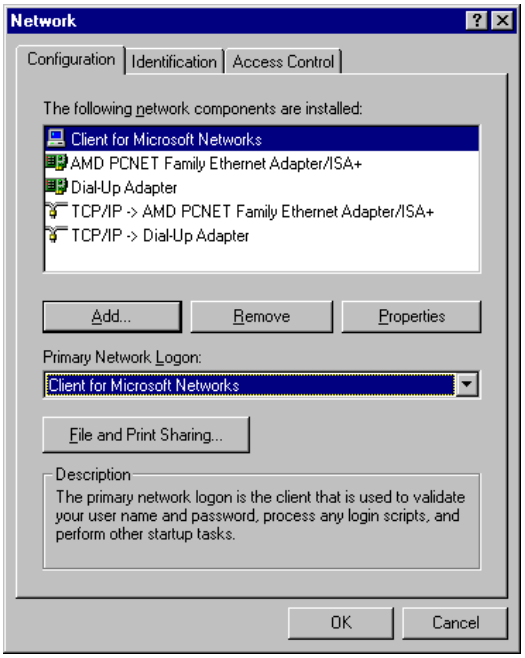

Select Network Service
Click the Network Service that you want to install, then click OK. If you have an installation disk for this device, click Have Disk.
Models:
File and printer sharing for Microsoft Networks
File and printer sharing for NetWare Networks
Service for NetWare Directory Services
Have Disk...
OK
Cancel

4. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Set Your Primary Network Logon (NT Server Connection):

Windows 95/98:

1. In the *Primary Network Logon* option box on the **Configuration** tab of the **Network** dialog box, select (the previously installed) **Client for Microsoft Networks**.

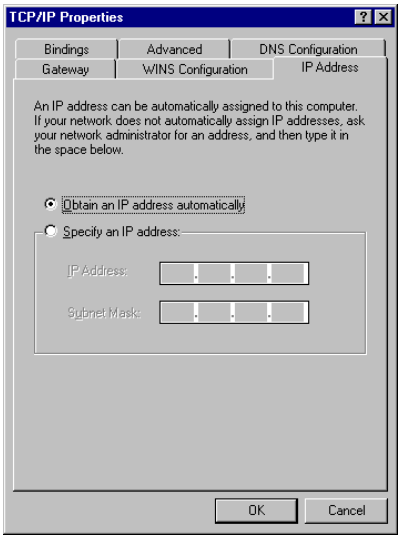


2. Click **OK** to close the **Network** dialog box.

Set up Properties of Components (NT Server Connection):

Dial-up Adapter:
Windows 95/98:

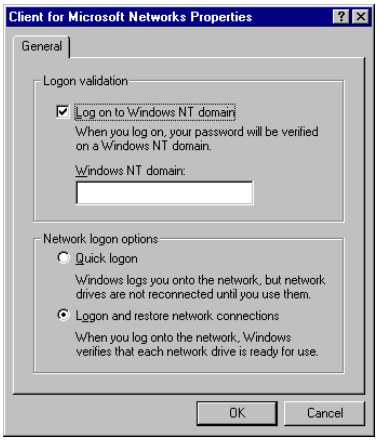
1. In the **Network** dialog box, *Configuration* tab, select the **TCP/IP - Dial-up adapter**.
2. Click **Properties**. The **TCP/IP Properties** dialog box opens with the *IP Address* tab selected.
3. Ensure that **Obtain an IP Address Automatically** is selected. (It's the default.)


TCP/IP Properties
Bindings
Advanced
DNS Configuration
Gateway
WINS Configuration
IP Address
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.
Obtain an IP address automatically
Specify an IP address:
IP Address:
Subnet Mask:
OK
Cancel

4. Click **OK** to close the **TCP/IP Properties** dialog box.

Network Client:
Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, select **Client for Microsoft Networks**.
2. Click **Properties**. The **Client for Microsoft Networks Properties** dialog box opens.
3. On the *General* tab, **select (**check) *"Log on to Windows NT domain."*
4. Click the **Windows NT domain** field, then enter the name of your Windows NT domain, as provided by your Network Administrator.

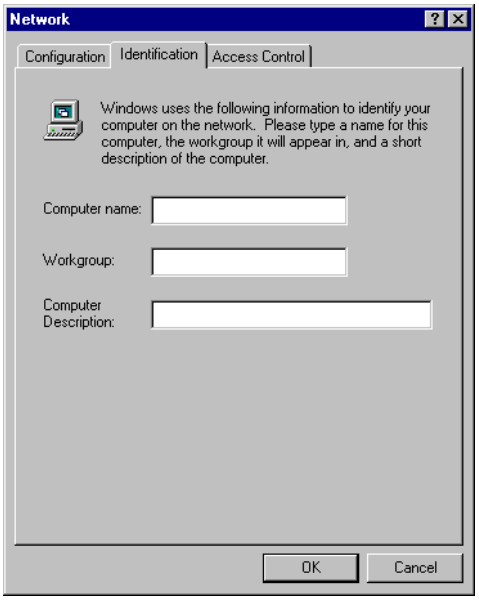

Client for Microsoft Networks Properties
General
Logon validation
Log on to Windows NT domain
When you log on, your password will be verified on a Windows NT domain.
Windows NT domain:
Network logon options
Quick logon
Windows logs you onto the network, but network drives are not reconnected until you use them.
Logon and restore network connections
When you log onto the network, Windows verifies that each network drive is ready for use.
OK
Cancel

5. Click **OK** to return to the **Network** dialog box.

Identification:

Windows 95/98:

1. In the **Network** dialog box, select the *Identification* tab.
2. In the *Workgroup* field, enter the name of your NT domain or the name of your workgroup as provided by your Network Administrator.
3. Enter a name and description for your computer in the fields provided.
4. Click **OK**.


Network
Configuration
Identification
Access Control
Windows uses the following information to identify your computer on the network. Please type a name for this computer, the workgroup it will appear in, and a short description of the computer.
Computer name:
Workgroup:
Computer Description:
OK
Cancel

Access:

Windows 95/98:

1. In the **Network** dialog box, select the *Access Control* tab.
2. In the *Control Access to Shared resources using* group, select **Share-Level access control**.

Network
Configuration
Identification
Access Control
Control access to shared resources using:
Share-level access control
Enables you to supply a password for each shared resource.
User-level access control
Enables you to specify users and groups who have access to each shared resource.
Obtain list of users and groups from:
OK
Cancel

3. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Note: *You must restart your system for the new settings to take effect.*

Once your machine has restarted, you may continue the configuration process.

Make Your New Connection (NT Server Connection):

Windows 95/98:

1. Double-click **My Computer**.
2. Double-click the **Dial-Up Networking** folder.
3. Double-click **Make New Connection** (or **Add New Connection**, Win98).
4. Follow the onscreen instructions to configure your connection.

Windows NT:

1. Double-click **My Computer**.
2. Double-click **Dial-Up Networking**.
3. When the **Dial-Up Networking** dialog box opens, click **Install**.
4. Follow the onscreen instructions to configure your connection.

Set Dial-up type (NT Server Connection):

Windows 95/98:

1. **Right-click** the newly created connection icon, then click **Properties**; the **My Connection** dialog box opens.
2. On the **General** tab, click *Server Type;* the **Server Types** dialog box opens. Select **PPP: Windows 95, Windows NT 3.5, Internet**.
3. Click (to check or enable) only the following items: **Log on to network**, **Enable software compression**, and **TCP/IP**. [**Note:** do not disturb any other items that are already checked.]

Dial in to your network (NT Server Connection):

Windows 95/98:

1. You are ready to dial in to your network.
2. Double-click the *new connection* icon; the **Connect To** dialog box opens.
3. Enter the user name (if necessary) and password configured for you on the RF500S.

   Note: If your particular situation permits, click (to check) **Save password**.
4. Click **Connect**.
5. After connecting to the RF500S, you can access the same services and resources as if you were connected to the network locally.

Accessing a Novell Server

Novell NetWare products are used on up to 70 percent of PC-based local area networks (LANs). Perform the following procedures when you need to connect your PC workstation to a remote Novell Server.

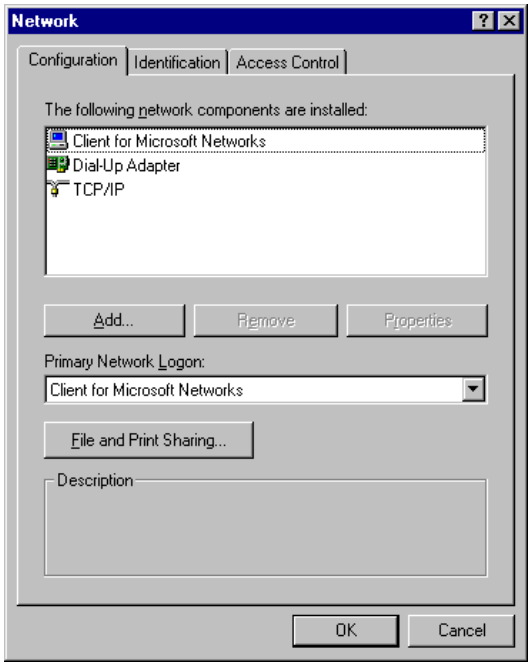
Adding the dial-up adapter (Novell Server Connection):

Windows 95/98:

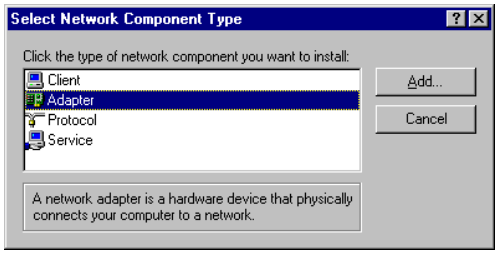
1. Click **Start** | **Settings** | **Control Panel**.
2. Double-click the *Network* icon to open the **Network** dialog box.

Win95

Win98

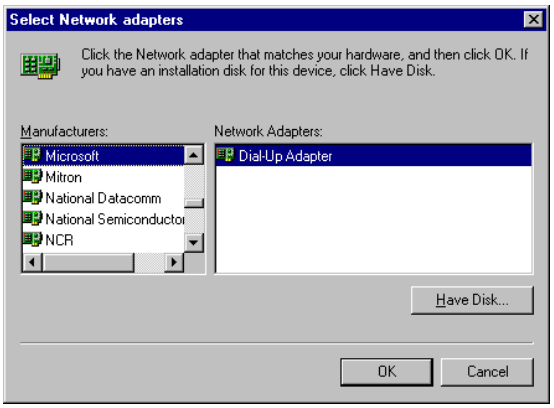


3. Click **Add**. The **Select Network Component Type** dialog box opens.



4. Select (i.e., highlight) **Adapter**, then click **Add**. The **Select Network adapters** dialog box opens.

Win95/98



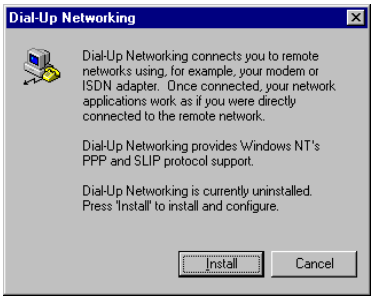
5. In the *Manufacturer*s option box, select **Microsoft**. In the *Network Adapter*s option box select **Dial-up adapter**.

6. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Windows NT:

Dial-up Networking adds PPP and SLIP protocol support, enabling your workstation to gain access to a remote computer or network, even if your computer is not on a network.

1. Double-click **My Computer**, then double-click **Dial-Up Networking**. The following screen is displayed:


Dial-Up Networking
Dial-Up Networking connects you to remote networks using, for example, your modem or ISDN adapter. Once connected, your network applications work as if you were directly connected to the remote network.
Dial-Up Networking provides Windows NT's PPP and SLIP protocol support.
Dial-Up Networking is currently uninstalled. Press 'Install' to install and configure.
Install
Cancel

2. Click **Install**, then follow the onscreen instructions to configure your connection.

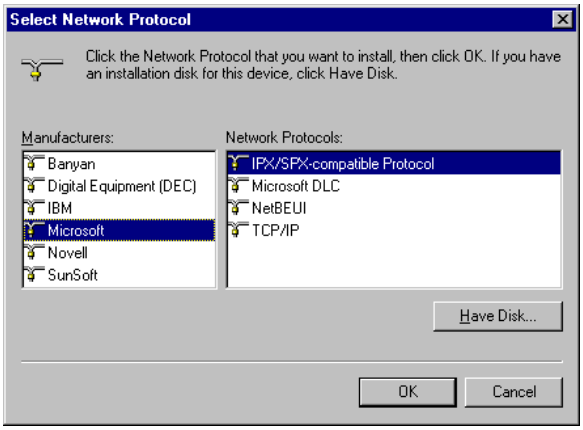
Adding IPX/SPX (Novell Server Connection):

Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, click **Add**. The **Select Network Component Type** dialog box opens.

2. Select **Protocol** and click **Add**. The **Select Network Protocol** dialog box opens.

3. In the *Manufacturers* option box, select **Microsoft**. In the **Network Protocols** option box, select **IPX/SPX-compatible Protocol**.



4. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Windows NT:

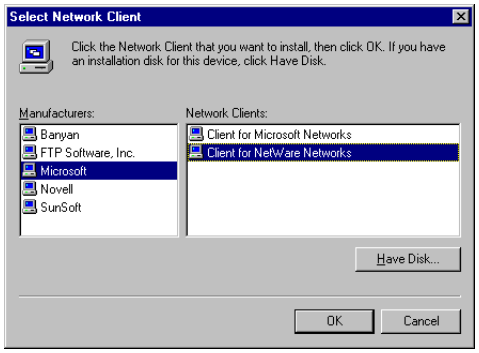
Note: *NWLink IPX/SPX Compatible Transport is probably already installed, along with NWLink NetBIOS and TCP/IP Protocol; however, if NWLink IPX/SPX Compatible Transport does not appear on* the *Protocols* tab of the **Network** dialog box, perform the following steps:

1. In the **Network** dialog box, *Protocol* tab, click **Add**. The **Select Network Protocol** dialog box opens.
2. Select **NWLink IPX/SPX Compatible Transport ,** then click **OK** to return to the **Network** dialog box.
3. Click **Close** to close the **Network** dialog box and return to the Desktop.

Adding Client for NetWare Networks (Novell Server Connection):

Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, click **Add**.
2. Select **Network Client** and click **Add**.
3. The **Select Network Client** dialog box displays. In the **Manufacturer's** option box, select **Microsoft**. In the **Network Clients** option box, select **Client for NetWare Networks**.

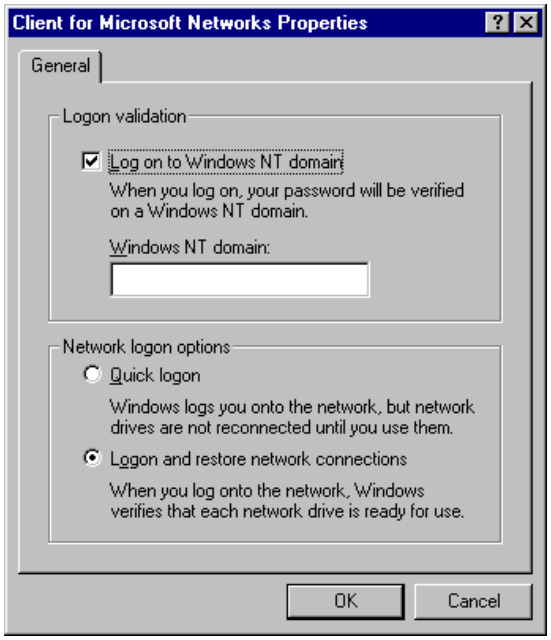


4. Click **OK** to add this Client and return to the **Network** dialog box.

Set Up Properties of Components (Novell Server Connection):

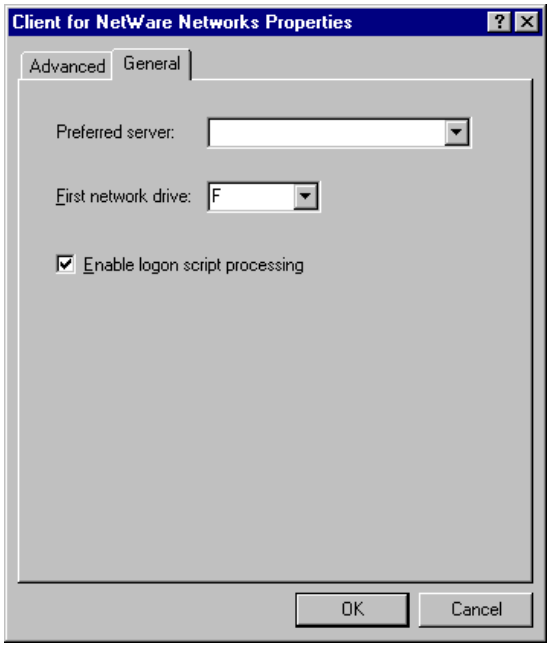
Network Client:
Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, select **Client for Microsoft Networks**.
2. Click **Properties**. The **Client for Microsoft Networks Properties** dialog box opens.
3. On the *General* tab, **select** (check) *"Log on to Windows NT domain."*
4. Click the **Windows NT domain** field, then enter the name of your Windows NT domain, as provided by your Network Administrator.


Client for Microsoft Networks Properties
General
Logon validation
Log on to Windows NT domain
When you log on, your password will be verified on a Windows NT domain.
Windows NT domain:
Network logon options
Quick logon
Windows logs you onto the network, but network drives are not reconnected until you use them.
Logon and restore network connections
When you log onto the network, Windows verifies that each network drive is ready for use.
OK
Cancel

5. Click **OK** to return to the **Network** dialog box.
6. In the **Network** dialog box, *Configuration* tab, select **Client for NetWare Networks**.

7. Click **Properties**.



8. On the *General* tab, in the Preferred server field, enter the name of your Novell Server Domain. If necessary, select the **First Network Drive**, then ensure that **Enable logon script processing** is checked (enabled). (It's the default.)

9. Click **OK** to return to the **Network** dialog box.

Set Your Primary Network Logon:

Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, select **Client for NetWare Networks** as the Primary Network Logon.

Network
Configuration
Identification
Access Control
Control access to shared resources using:
Share-level access control
Enables you to supply a password for each shared resource.
User-level access control
Enables you to specify users and groups who have access to each shared resource.
Obtain list of users and groups from:
OK
Cancel

2. Click **OK**. You are returned to the Desktop.

Set Your Access Control (Novell Server Connection):

Windows 95/98:

1. In the **Network** dialog box, select the *Access Control* tab.
2. In the *Control Access to shared resources using* option box, select **Share-Level Access Control**.

Note: *You must restart your system for the new settings to take effect.*

Make Your New Connection (Novell Server Connection):

Windows 95/98:

1. Double-click **My Computer**.
2. Double-click the **Dial-Up Networking** folder.
3. Double-click **Make New Connection** (or **Add New Connection**, Win98).
4. Follow the onscreen instructions to configure your connection.

Windows NT:

1. Double-click **My Computer**.
2. Double-click **Dial-Up Networking**.
3. When the **Dial-Up Networking** dialog box opens, click **Install**.
4. Follow the onscreen instructions to configure your connection.

Set Dial-up type (Novell Server Connection):

Windows 95/98:

1. **Right-click** the newly created connection icon, then click **Properties**; the **My Connection** dialog box opens.
2. On the **General** tab, click *Server Type;* the **Server Types** dialog box opens. Select **PPP: Windows 95, Windows NT 3.5, Internet**.
3. Click (to check or enable) only the following items: **Log on to network**, **Enable software compression**, and **TCP/IP**. [**Note:** do not disturb any other items that are already checked.]

Dial in to your network (Novell Server Connection):

Windows 95/98:

1. You are ready to dial in to your network.
2. Double-click the *new connection* icon; the **Connect To** dialog box opens.
3. Enter the user name (if necessary) and password configured for you on the RF500S.

Note: *If your particular situation permits, click (to check)* ***Save password****.*

4. Click **Connect**.
5. After connecting to the RF500S, you can access the same services and resources as if you were connected to the network locally.

Accessing a Windows NT Server and a Novell NetWare Server

Note: *Before configuring your remote site, ensure TCP/IP has been installed on your NT Server.*

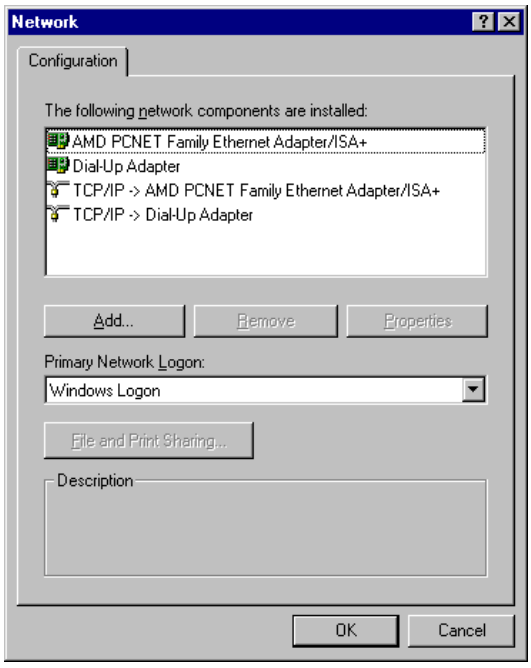
Perform the following procedures if your PC workstation needs to access **both** a Windows NT Server and a Novel NetWare Server.

Adding the dial-up adapter (Novell/NT Server Connection):

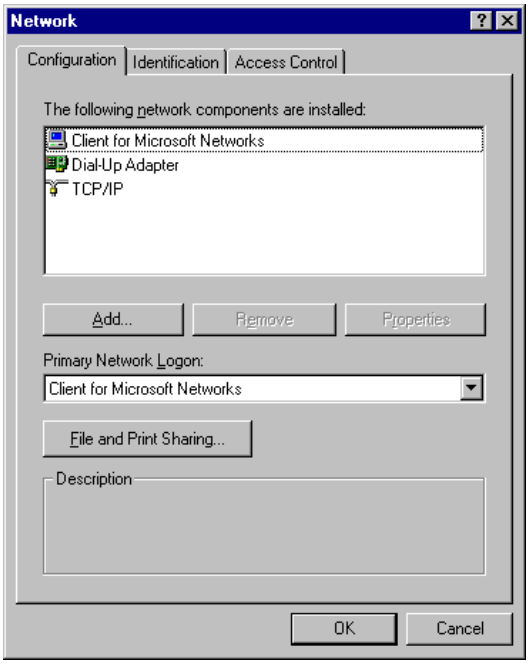
Windows 95/98/NT:

1. Click **Start** | **Settings** | **Control Panel**.
2. Double-click the *Network* icon to open the **Network** dialog box.

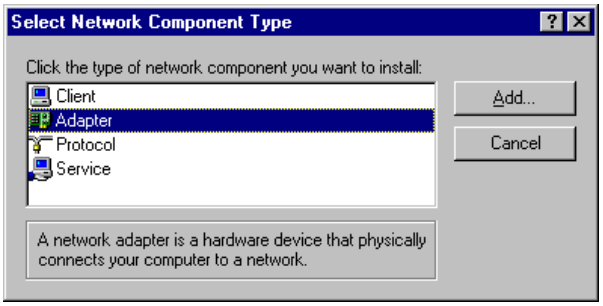
Win95



Win98

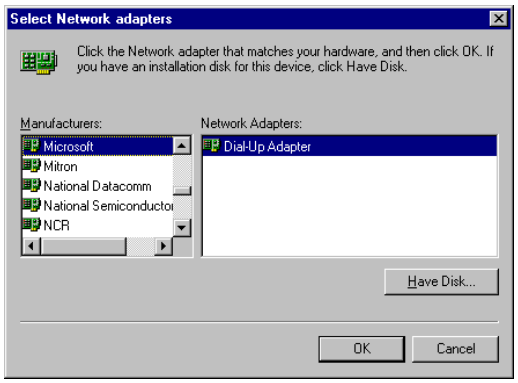


3. Click **Add**; the **Select Network Component Type** dialog box opens.

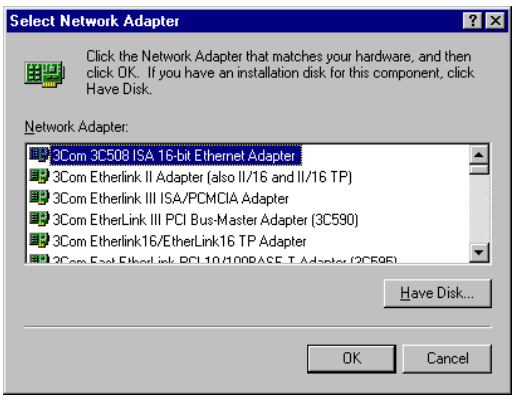


4. Select (i.e., highlight) **Adapter**, then click **Add**. The **Select Network adapters** dialog box opens.

Win95/98



WinNT


Select Network Adapter
Click the Network Adapter that matches your hardware, and then click OK. If you have an installation disk for this component, click Have Disk.
Network Adapter:
3Com 3C508 ISA 16-bit Ethernet Adapter
3Com Etherlink II Adapter (also II/16 and II/16 TP)
3Com Etherlink III ISA/PCMCIA Adapter
3Com EtherLink III PCI Bus-Master Adapter (3C590)
3Com Etherlink16/EtherLink16 TP Adapter
Have Disk...
OK
Cancel

5. (Win95/98 only) In the *Manufacturer*s option box, select **Microsoft**. In the *Network Adapter*s option box select **Dial-up adapter**.

   [**Note:** In Windows NT workstation there is no *Manufacturers* option box.]

6. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

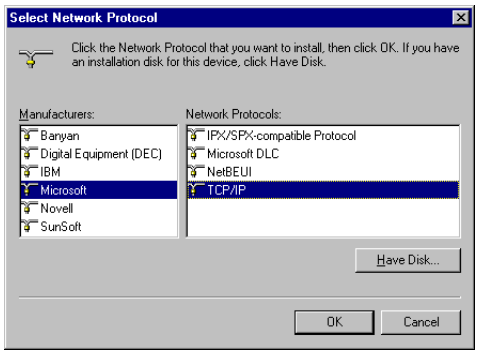
Adding TCP/IP (Novell/NT Server Connection):

Windows 95/98/NT:

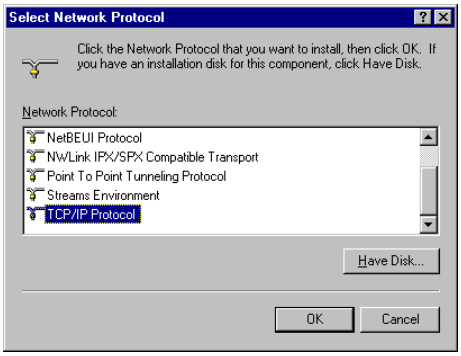
1. In the **Network** dialog box, *Configuration* tab, click **Add**.
2. Select **Protocol** and click **Add**.
3. The **Select Network Protocol** dialog box is displayed. In the *Manufacturers* option box [Win95 only], select **Microsoft**. In the **Network Protocols** option box, select **TCP/IP** [Win95/98] or **TCP/IP Protocol** [WinNT only].

   [**Note:** Windows NT workstation has no *Manufacturers* option box.]

Win95/98



WinNT

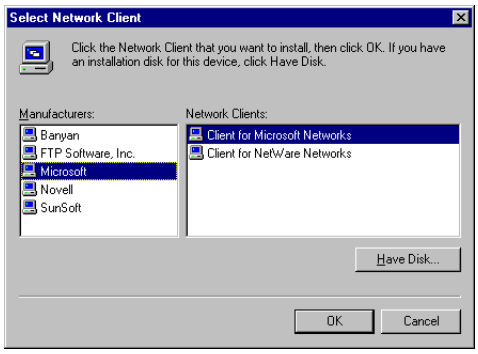

Select Network Protocol
Click the Network Protocol that you want to install, then click OK. If you have an installation disk for this component, click Have Disk.
Network Protocol:
NetBEUI Protocol
NWLink IPX/SPX Compatible Transport
Point To Point Tunneling Protocol
Streams Environment
TCP/IP Protocol
Have Disk...
OK
Cancel

4. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Adding Client for Microsoft Networks (Novell/NT Server Connection):

Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, click **Add**.
2. Select **Network Client** and click **Add**.
3. The **Select Network Client** dialog box displays. In the **Manufacturer's** option box, select **Microsoft**. In the **Network Clients** option box, select **Client for Microsoft Networks**.



4. Click **OK** to add this Client and return to the **Network** dialog box.

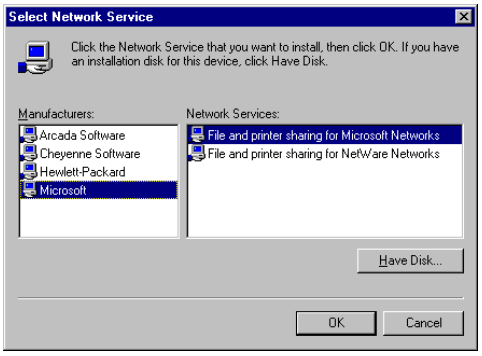
Adding File and Print Sharing for Microsoft Networks (Novell/NT Server Connection):

Windows 95/98:

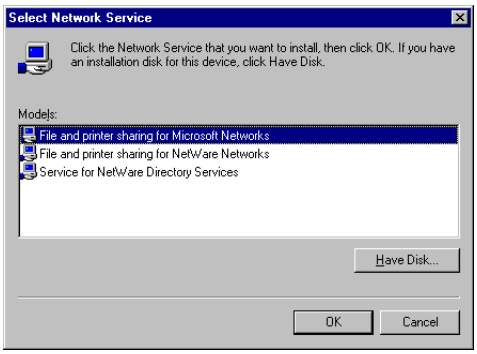
1. In the **Network** dialog box, *Configuration* tab, click **Add**.
2. Select **Services** and click **Add**.
3. The **Select Network Service** dialog box displays. In the *Manufacturers* option box, select **Microsoft**. Select **File and Printer sharing for Microsoft Networks.**

   [**Note:** Windows 98 has no *Manufacturers* option box.]

Win95


Select Network Service
Click the Network Service that you want to install, then click OK. If you have an installation disk for this device, click Have Disk.
Manufacturers:
Arcada Software
Cheyenne Software
Hewlett-Packard
Microsoft
Network Services:
File and printer sharing for Microsoft Networks
File and printer sharing for NetWare Networks
Have Disk...
OK
Cancel

Win98

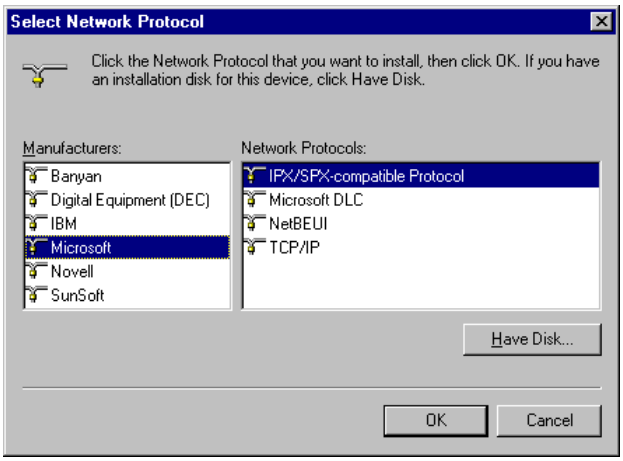

Select Network Service
Click the Network Service that you want to install, then click OK. If you have an installation disk for this device, click Have Disk.
Models:
File and printer sharing for Microsoft Networks
File and printer sharing for NetWare Networks
Service for NetWare Directory Services
Have Disk...
OK
Cancel

4. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Adding IPX/SPX (Novell/NT Server Connection):

Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, click **Add**. The **Select Network Component Type** dialog box opens.
2. Select **Protocol** and click **Add**. The **Select Network Protocol** dialog box opens.
3. In the *Manufacturers* option box, select **Microsoft**. In the **Network Protocols** option box, select **IPX/SPX-compatible Protocol**.



4. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Windows NT:

Note: *NWLink IPX/SPX Compatible Transport is probably already installed, along with NWLink NetBIOS and TCP/IP Protocol; however, if NWLink IPX/SPX Compatible Transport does not appear on the Protocols* tab of the **Network** dialog box, perform the following steps:

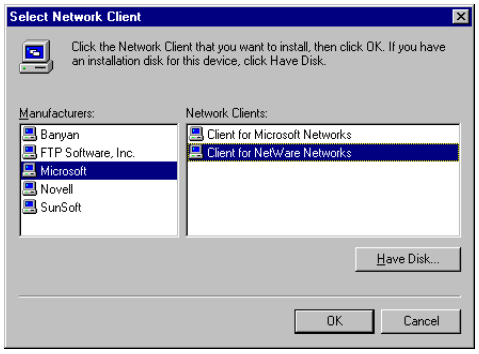
1. In the **Network** dialog box, *Protocol* tab, click **Add**. The **Select Network Protocol** dialog box opens.
2. Select **NWLink IPX/SPX Compatible Transport ,** then click **OK** to return to the **Network** dialog box.
3. Click **Close** to close the **Network** dialog box and return to the Desktop.

Adding Client for NetWare Networks (Novell/NT Server Connection):

Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, click **Add**.
2. Select **Network Client** and click **Add**.

3. The **Select Network Client** dialog box displays. In the **Manufacturer's** option box, select **Microsoft**. In the **Network Clients** option box, select **Client for NetWare Networks**.

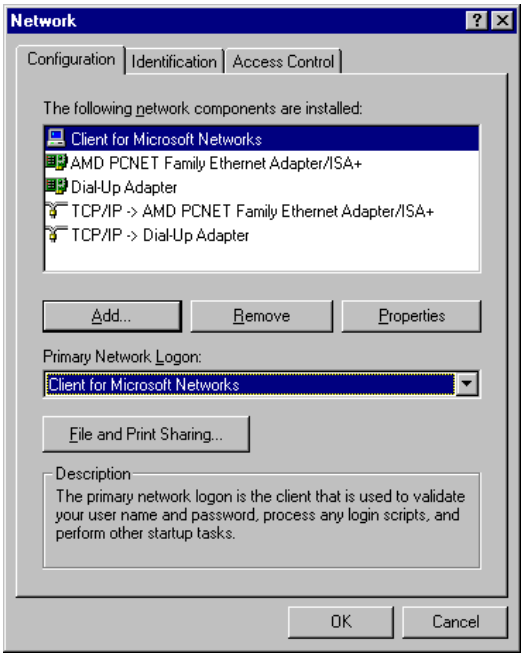


4. Click **OK** to add this Client and return to the **Network** dialog box.

Set Your Primary Network Logon (Novell/NT Server Connection):

Windows 95/98:

1. In the *Primary Network Logon* option box on **Configuration** tab of the **Network** dialog box, select (the previously installed) **Client for Microsoft Networks**.

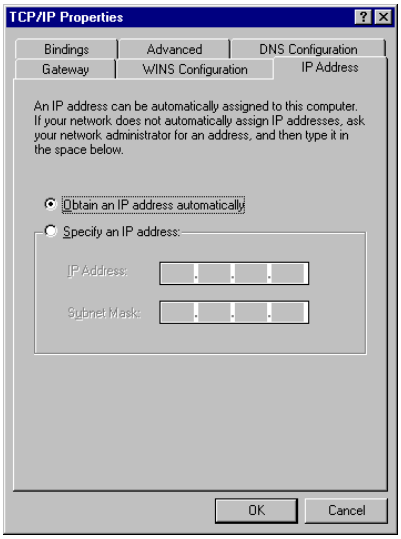


2. Click **OK** to close the **Network** dialog box.

Set Up Properties of Components (Novell/NT Server Connection):

Dial-up Adapter:
Windows 95/98:

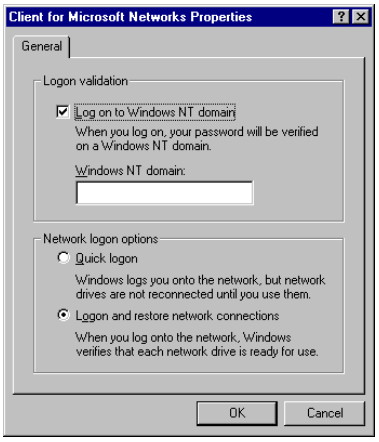
1. In the **Network** dialog box, *Configuration* tab, select the **TCP/IP - Dial-up adapter**.
2. Click **Properties**. The **TCP/IP Properties** dialog box opens with the *IP Address* tab selected.
3. Ensure that **Obtain an IP Address Automatically** is selected. (It's the default.)


TCP/IP Properties
Bindings
Advanced
DNS Configuration
Gateway
WINS Configuration
IP Address
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.
Obtain an IP address automatically
Specify an IP address:
IP Address:
Subnet Mask:
OK
Cancel

4. Click **OK** to close the **TCP/IP Properties** dialog box.

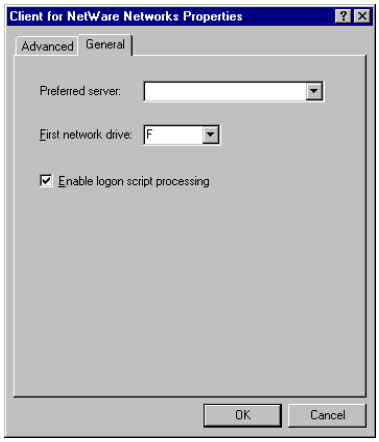
Network Client:
Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, select **Client for Microsoft Networks**.
2. Click **Properties**. The **Client for Microsoft Networks Properties** dialog box opens.
3. On the *General* tab, **select (check)** *"Log on to Windows NT domain."*
4. Click the **Windows NT domain** field, then enter the name of your Windows NT domain, as provided by your Network Administrator.


Client for Microsoft Networks Properties
General
Logon validation
Log on to Windows NT domain
When you log on, your password will be verified on a Windows NT domain.
Windows NT domain:
Network logon options
Quick logon
Windows logs you onto the network, but network drives are not reconnected until you use them.
Logon and restore network connections
When you log onto the network, Windows verifies that each network drive is ready for use.
OK
Cancel

5. Click **OK** to return to the **Network** dialog box.
6. In the **Network** dialog box, *Configuration* tab, select **Client for NetWare Networks**.

7. Click **Properties**.



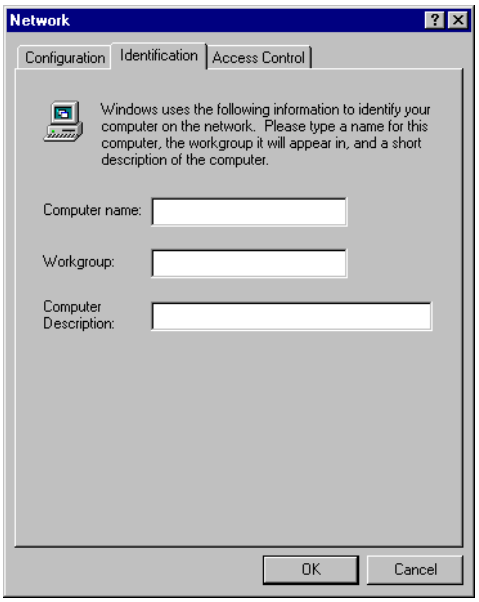
8. On the *General* tab, in the preferred Server field, enter the name of your Novell Server Domain. Select the **First Network Drive** and **Enable Logon Script processing**.
9. Click **OK**.

Network Protocol:
Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, select **IPX/SPX Compatible Protocol**.
2. Click **Properties**.
3. Disable **Client for Microsoft Networks** and **File and Printer Sharing for Microsoft Networks**. This will ensure that when you log into your NT server, Windows will use the TCP/IP protocol. Next, you must *enable* **Client for Microsoft Networks**.

Set Your Identification:
Windows 95/98:

1. In the **Network** dialog box, select the *Identification* tab.


Network
Configuration
Identification
Access Control
Windows uses the following information to identify your computer on the network. Please type a name for this computer, the workgroup it will appear in, and a short description of the computer.
Computer name:
Workgroup:
Computer Description:
OK
Cancel

2. In the *Workgroup* field, enter the name of your NT domain or the name of your workgroup as provided by your Network Administrator.
3. Enter a name and description for your computer in the fields provided.
4. Click **OK**.

Set Your Access Control:

Windows 95/98:

1. In the **Network** dialog box, select the *Access Control* tab.
2. In the *Control Access to Shared resources using* group, select **Share-Level access control**.

Network
Configuration
Identification
Access Control
Control access to shared resources using:
Share-level access control
Enables you to supply a password for each shared resource.
User-level access control
Enables you to specify users and groups who have access to each shared resource.
Obtain list of users and groups from:
OK
Cancel

3. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Note: *You must restart your system for the new settings to take effect.*

Once your machine has restarted, you may continue the configuration process.

Make Your New Connection (NT/Novell Server Connection):

Windows 95/98:

1. Double-click **My Computer**.
2. Double-click the **Dial-Up Networking** folder.
3. Double-click **Make New Connection** (or **Add New Connection**, Win98).
4. Follow the onscreen instructions to configure your connection.

Windows NT:

1. Double-click **My Computer**.
2. Double-click **Dial-Up Networking**.
3. When the **Dial-Up Networking** dialog box opens, click **Install**.
4. Follow the onscreen instructions to configure your connection.

Set Dial-up type (NT/Novell Server Connection):

Windows 95/98:

1. **Right-click** the newly created connection icon, then click **Properties**; the **My Connection** dialog box opens.
2. On the **General** tab, click *Server Type;* the **Server Types** dialog box opens. Select **PPP: Windows 95, Windows NT 3.5, Internet**.
3. Click (to check or enable) only the following items: **Log on to network**, **Enable software compression**, and **TCP/IP**. [**Note:** do not disturb any other items that are already checked.]

Dial in to your network (NT/Novell Server Connection):

Windows 95/98:

1. You are ready to dial in to your network.
2. Double-click the *new connection* icon; the **Connect To** dialog box opens.
3. Enter the user name (if necessary) and password configured for you on the RF500S.

   Note: If your particular situation permits, click (to check) **Save password**.
4. Click **Connect**.
5. After connecting to the RF500S, you can access the same services and resources as if you were connected to the network locally.

Accessing a Unix Server

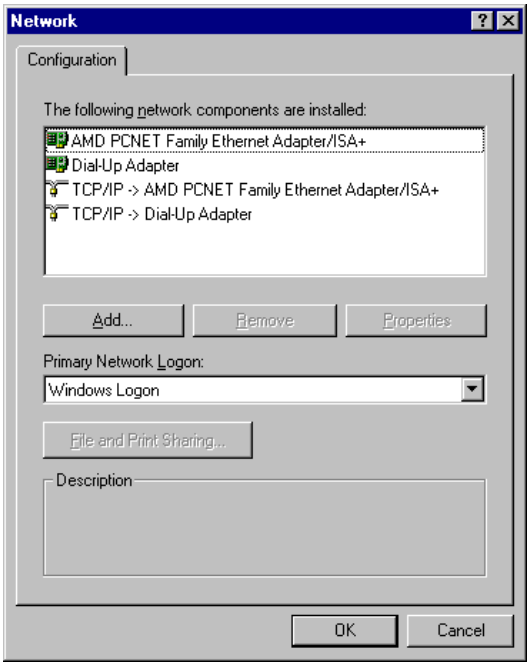
Perform the following procedures to prepare your PC workstation to access a remote Unix Server.

Adding the dial-up adapter (Unix Server Connection):

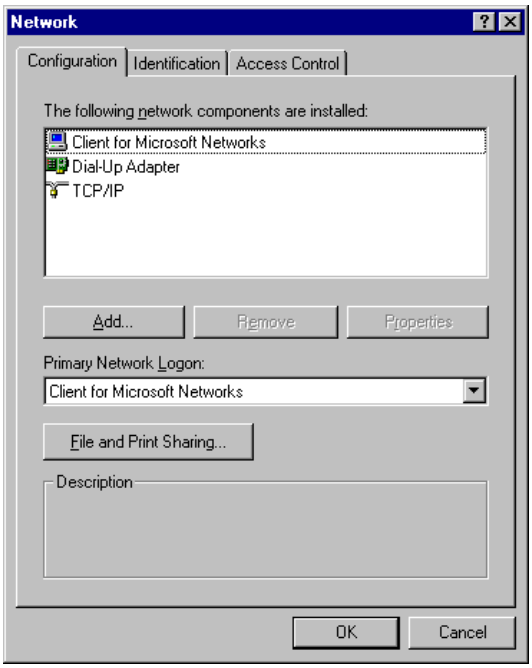
Windows 95/98/NT:

1. Click **Start** | **Settings** | **Control Panel**.
2. Double-click the *Network* icon to open the **Network** dialog box.

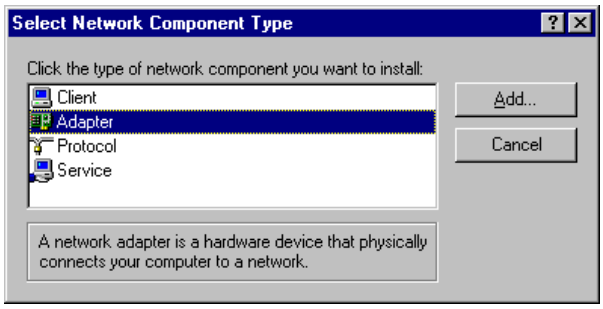
Win95



Win98

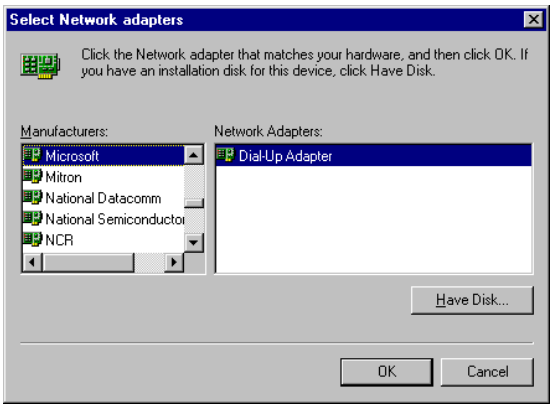


3. Click **Add**; the **Select Network Component Type** dialog box opens.



4. Select (i.e., highlight) **Adapter**, then click **Add**. The **Select Network adapters** dialog box opens.

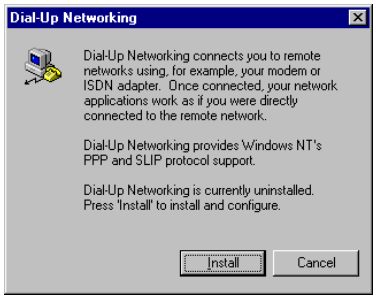
Win95/98



5. In the *Manufacturer*s option box, select **Microsoft**. In the *Network Adapter*s option box select **Dial-up adapter**.
6. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Windows NT:
Dial-up Networking adds PPP and SLIP protocol support, enabling your workstation to gain access to a remote computer or network, even if your computer is not on a network.

1. Double-click **My Computer**, then double-click **Dial-Up Networking**. The following screen is displayed:


Dial-Up Networking
Dial-Up Networking connects you to remote networks using, for example, your modem or ISDN adapter. Once connected, your network applications work as if you were directly connected to the remote network.
Dial-Up Networking provides Windows NT's PPP and SLIP protocol support.
Dial-Up Networking is currently uninstalled. Press 'Install' to install and configure.
Install
Cancel

2. Click **Install**, then follow the onscreen instructions to configure your connection.

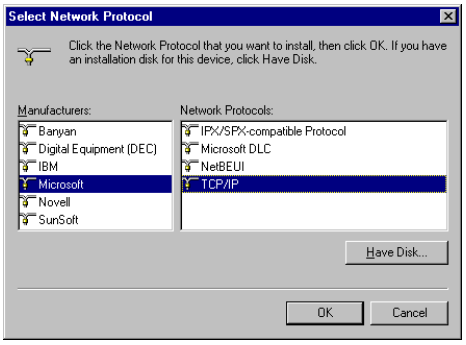
Adding TCP/IP (Unix Server Connection):

Windows 95/98/NT:
1. In the **Network** dialog box, *Configuration* tab, click **Add**.
2. Select **Protocol** and click **Add**.

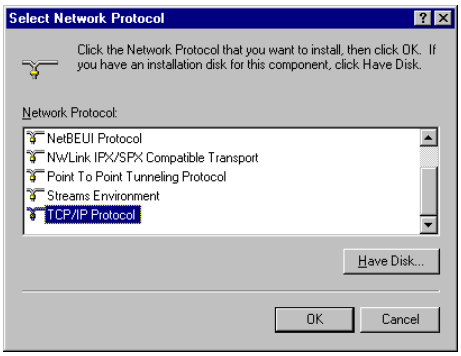
3. The **Select Network Protocol** dialog box is displayed. In the *Manufacturers* option box [Win95 only], select **Microsoft**. In the **Network Protocols** option box, select **TCP/IP** [Win95/98] or **TCP/IP Protocol** [WinNT only].

   [**Note:** Windows NT workstation has no *Manufacturers* option box.]

Win95/98



WinNT


Select Network Protocol
Click the Network Protocol that you want to install, then click OK. If you have an installation disk for this component, click Have Disk.
Network Protocol:
NetBEUI Protocol
NWLink IPX/SPX Compatible Transport
Point To Point Tunneling Protocol
Streams Environment
TCP/IP Protocol
Have Disk...
OK
Cancel

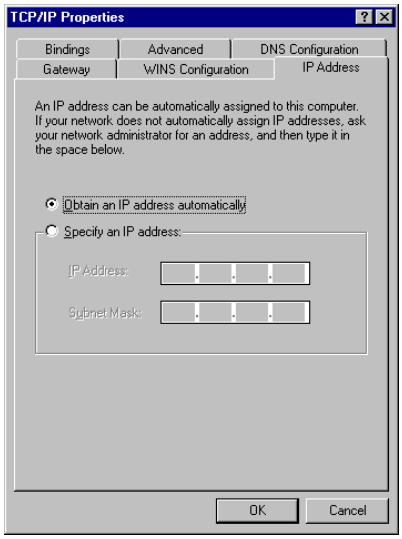
4. Click **OK** (twice) to return to, and then close, the **Network** dialog box.

Set Up Properties of Components (Unix Server Connection):

Dial-up Adapter:

Windows 95/98:

1. In the **Network** dialog box, *Configuration* tab, select the **TCP/IP - Dial-up adapter**.
2. Click **Properties**. The **TCP/IP Properties** dialog box opens with the *IP Address* tab selected.
3. Ensure that **Obtain an IP Address Automatically** is selected. (It's the default.)


TCP/IP Properties
Bindings
Advanced
DNS Configuration
Gateway
WINS Configuration
IP Address
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.
Obtain an IP address automatically
Specify an IP address:
IP Address:
Subnet Mask:
OK
Cancel

4. Click **OK** to close the **TCP/IP Properties** dialog box.

Note: *You must restart your machines to enable the new settings.*

Make Your New Connection (Unix Server Connection):

Windows 95/98:

1. Double-click **My Computer**.
2. Double-click the **Dial-Up Networking** folder.
3. Double-click **Make New Connection** (or **Add New Connection**, Win98).
4. Follow the onscreen instructions to configure your connection.

Windows NT:

1. Double-click **My Computer**.
2. Double-click **Dial-Up Networking**.
3. When the **Dial-Up Networking** dialog box opens, click **Install**.
4. Follow the onscreen instructions to configure your connection.

Set Dial-up type (Unix Server Connection):

Windows 95/98:

1. **Right-click** the newly created connection icon, then click **Properties**; the **My Connection** dialog box opens.
2. On the **General** tab, click *Server Type;* the **Server Types** dialog box opens. Select **PPP: Windows 95, Windows NT 3.5, Internet**.
3. Click (to check or enable) only the following items: **Log on to network**, **Enable software compression**, and **TCP/IP**. [**Note:** do not disturb any other items that are already checked.]

Dial in to your network (Unix Server Connection):

Windows 95/98:

1. You are ready to dial in to your network.
2. Double-click the *new connection* icon; the **Connect To** dialog box opens.
3. Enter the user name (if necessary) and password configured for you on the RF500S.

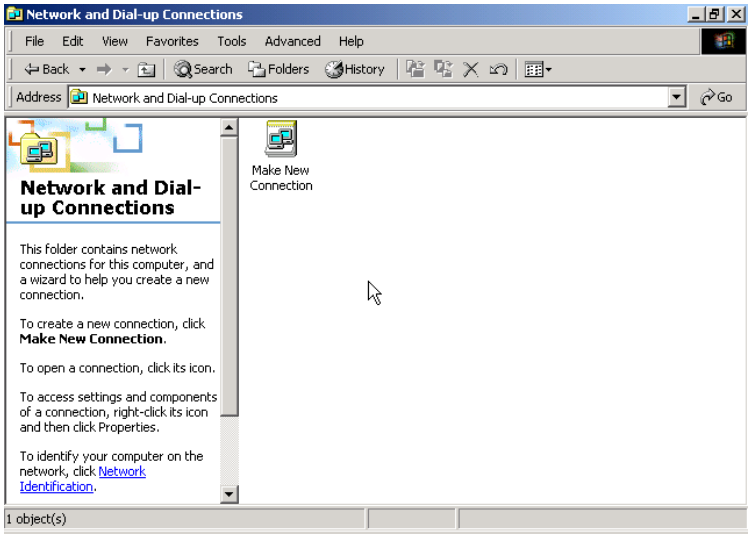
Note: *If your particular situation permits, click (to check)* ***Save password****.*

4. Click **Connect**.
5. After connecting to the RF500S, you can access the same services and resources as if you were connected to the network locally.

Make New Connection (Windows 2000 only)

Perform the following procedures to prepare your Windows 2000 PC workstation to access any of the remote Servers and enable applications such as e-mail, Web browsing, file sharing, and printing.

1. Double-click **My Computer**.
2. Double-click the **Network and Dial-up Connections** folder.


Network and Dial-up Connections
File Edit View Favorites Tools Advanced Help
Back Search Folders History
Address Network and Dial-up Connections
Go
Network and Dial-up Connections
This folder contains network connections for this computer, and a wizard to help you create a new connection.
To create a new connection, click Make New Connection.
To open a connection, click its icon.
To access settings and components of a connection, right-click its icon and then click Properties.
To identify your computer on the network, click Network Identification.
Make New Connection
1 object(s)

3. Double-click **Make New Connection**.

Welcome to the Network Connection Wizard
Using this wizard you can create a connection to other computers and networks, enabling applications such as e-mail, Web browsing, file sharing, and printing.
To continue, click Next.
< Back
Next >
Cancel

4. Click **Next >**, then follow the onscreen instructions to configure your connection.

RouteFinder™

Chapter 8 - LAN -to- LAN Settings

MultiTech® Systems

LAN -to- LAN Settings

Setting up LAN -to- LAN Routing

The majority of settings for LAN -to- LAN Routing are set up through RouteFinder Wizard or RouteFinder Manager when IP routing (NAT disabled) is configured. This section provides an overview of LAN -to- LAN Routing and shows you some of the benefits and limitations of LAN -to- LAN Routing.

Setting up a Windows machine to share files

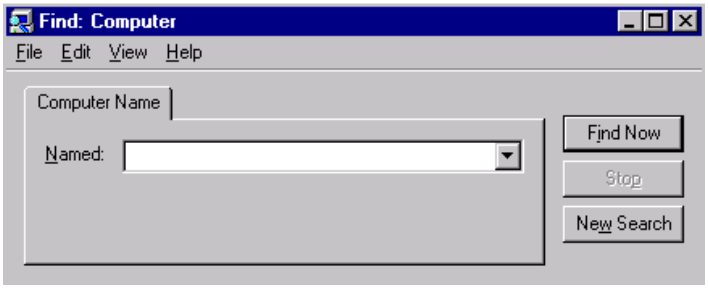
If you would like to share files over your network but don't want to install a Windows NT server, you can enable the file sharing feature of Windows. To set up file sharing:

Note: *Each computer that you wish to share files among must be within the same workgroup. Use the* ***Identification tab*** *of the Network Dialog box to define a workgroup name.*

1. Select **Start** | **Settings** | **Control Panel**.
2. Click **Network**.
3. Click **File and Printer Sharing**.
4. To enable file sharing, **select**, "*I want to be able to give others access to my files*".
5. If you haven't already done so, ensure that this computer has a fixed IP address on your local network. Refer to the LAN Client Settings chapter for information on configuring a fixed IP address.
6. After configuring and activating the fixed IP address, using *My Computer* or *Windows Explorer*, **right click** the file or drive on the computer that you would like to share.
7. Select **Sharing**.
8. Enable sharing by selecting **Shared As**. Enter the name by which you would like this file or drive to be known on your network.
9. You may now share the file(s) on this computer.

Using the Find Computer command

If your clients are in different subnets or separated by a router, you will not be able to use the Find Computer function within Windows by selecting **Start** | **Find** | **Computer**.



In the **Find Computer** dialog box, type the IP address of the computer you would like to find in the *Named* field. If you choose a computer on a remote network, the network device will attempt to establish a dial-up connection to the remote LAN based on settings entered in RouteFinder manager. If you have entered the computer's IP address and host name into your LMHosts file, you may enter the computer's host name, rather than the IP address in the *Named* field (refer to the following LMHosts section of this User Guide).

Note: *If the computer you are attempting to access is on a remote LAN, you may need to press* ***Find Now*** *more than once while you wait for your network device to establish a dial-up connection to your remote LAN.*

Using LMHosts

Important: *Each computer on the LAN must have a copy of this lookup table. Once you have mapped the necessary computer or host names and IP addresses in the LMHosts file, copy this file to the appropriate folder on each computer on the LAN. This file is located in your x:\Windows folder, where x: is the drive letter associated with the location of your windows operating system. Use Windows Explorer,* ***Tools*** *|* ***Find*** *|* ***Files or Folders*** *option to search for LMHosts.*

The LMHosts file can be edited using a text editor such as **Notepad**. At the end of the file, enter the IP address, followed by a space, then the host or computer name. Add all necessary IP addresses and computer names to the LMHosts file and save the file.

Once the LMHost file has been copied to each computer, the user will be able to enter the name of the computer they want to access on the LAN without having to remember the IP address.

When using **Find Computer**, you may enter either an IP address or the computer's *host* name if you have entered the name and IP address in your LMHosts lookup table.

Note: *Since the computers you'll add to the LMHosts file are generally servers, only computers with fixed IP addresses should be added to this file.*

RouteFinder™

Chapter 9 - Troubleshooting

MultiTech® Systems

Troubleshooting

This chapter provides a list of common problems encountered while installing, configuring or administering the RF500S. In the event you are unable to resolve your problem, refer to the Service, Warranty and Technical Support chapter of this User Guide for information about contacting our Technical Support representatives.

Common Problems

Problem #1

My computer can't detect my RouteFinder on the LAN when I start one of the RouteFinder Utilities (i.e. Device Not Found).

• Try pressing the **Refresh Device List** button.

• Unplug your network device and plug it back in, then press **Refresh Device List**.

• Ensure your computer has TCP/IP properly configured. You can check this by trying to "ping" the computer you are using. If you can successfully ping the computer from itself, the computer has TCP/IP correctly installed. Once you determine that you are able to ping the computer, try to ping another computer in the same segment of your network. If this ping is successful, your computer is properly connected to the network.

• Remove the TCP/IP Dial-up Adapter from your computer. For instructions, see **Problem #2** in this section.

• Ensure your network device is properly connected to your Ethernet hub by pressing **Refresh Device List** in either **RouteFinder Manager** or **RouteFinder Monitor**. If your RouteFinder is correctly connected, the *WAN* indicator light on your RouteFinder will flash. If no flash occurs, it is not properly connected to the network. Reconnect your network device to the hub and try again. If there is still no flash, it is possible the Ethernet cable or hub has a problem.

Problem #2

Other computers can connect to the network device, but my computer can't.

Whenever I click on Internet Explorer or Netscape, I see the Windows Dial-up utility popping up on my screen asking for my phone number and password to dial-up my ISP.

• Remove the TCP/IP dial-up adapter from all computers that will be using your RouteFinder to access the Internet. TCP/IP dial-up adapter is not needed to use the RF500S to connect to the Internet.

1. To remove the **Dial-up Adapter**, click **Start** | **Settings** | **Control Panel**.
2. Double-click the **Network** icon.
3. Click the **Dial-up Adapter** and press **Remove**. Restart the computer and try again.

• Ensure you have a correct IP address. From a DOS window in Windows 95/98, type **winipcfg**. From Windows NT, type **ipconfig**. If the address field is listed as 0.0.0.0, the computer does not have an IP address and you must ensure the automatic DHCP configuration has been correctly set up for this computer.

• Ensure that the Web browser is properly configured to connect to the Internet via the LAN.

Problem #3

The RouteFinder is connected to the Cable/DSL, but has problems accessing the Internet.

- Ensure the workstation has TCP/IP properly configured.
- Attempt to ping the IP address of the RF500S.
- Use **RouteFinder Monitor** to see if the WAN Ethernet port has successfully acquired a dynamic IP address from the ISP, or if the static IP address is valid.
- Use **Winipcfg** (Windows 95/98) or **ipconfig** (Windows NT/ 2000) to check to see if the computer's IP settings are correct.
- Ensure the DNS settings are correct.
- Ensure the Gateway IP address is the device's LAN Ethernet IP address (Server IP address).
- Ensure the IP address netmask is correct.

Problem #4

When I install the RouteFinder Utilities, I get the error message "missed export file oleaut32.dll"

If you are using Windows 95/98, your computer has an old version of **oleaut32.dll**.

- Download the newest version of **oleaut32.dll** from the Microsoft web site (http://www.microsoft.com).
- Create a backup of the file **c:\windows\system\oleaut32.dll**.
- Copy the new file to **c:\windows\system\oleaut32.dll**.
- After you have successfully copied the file, reinstall the RouteFinder Utilities.
- If you have problems with the new oleaut.dll file, use the backup file.

Problem #5

I configured my RouteFinder but I can't get it to communicate with my modem.

- Check your initialization string. If you are using an ISDN TA and your ISDN TA was not listed as a choice in Setup Wizard, refer to the ISDN TA User Guide for the appropriate initialization string.
- After ensuring that the initialization string is correct, use the on-line help in RouteFinder Monitor.

Problem #6

My RouteFinder dials-up a connection, but can't seem to communication with the ISP.

- Verify that your baudrate is not set too high for your modem or ISDN TA. The maximum baudrate that your modem or ISDN claims it can achieve may not be attainable due to poor line or connection quality. Use RouteFinder Manager's Modem settings menu to correct set the baudrate to a lower rate and retry the connection.
- After lowering the baudrate, you are still not able to establish a connection, use the RouteFinder Monitor's on-line help. If your connection still doesn't work, contact your ISP.

Problem #7

Sometimes when I try and use the Internet or get my mail, the application can't connect to the Internet immediately.

- The most common reason for this is not due to a problem or error. If you are the first person to make a connection to the Internet through the RF500S, there will be a delay when the Dial-On-Demand function automatically makes the connection and logs on to your ISP. Subsequent users will be able to use the connection you've established without a delay.
- If the scenario described above does not fit your situation, use RouteFinder monitor to view all events that are taking place between the modem and your ISP as you attempt to make a connection (e.g., a busy signal).

Problem #8

After installing my RF500S, my modem connection seems to be slower.

- The RouteFinder device should have no effect on the modem speed. However, if more than one client is using the same modem through the RouteFinder, the speed will be reduced.
- Run **RouteFinder Monitor** to view the number of concurrent client connections to your ISP.

Problem #9

While the Serial async port is in use, my RF500S keeps dialing a connection to the Internet, but no one is using the Internet.

- The RF500S will only dial the connection if there is a request from one of the computers on the LAN for an IP address on the Internet. Keep in mind that certain applications can be configured to request information from the Internet. For example, Microsoft Outlook can be set up to "check for new mail every x minutes". If this feature is enabled, Outlook will send a request for your Internet POP3 server which will cause your RF500S to dial-up your ISP. To determine which computer on your network is processing a request for an Internet connection, use the **RouteFinder Monitor**. The event messages will provide information about which computer is causing the RF500S to dial and which service (port#) the computer is requesting.

Problem #10

The "Please set the Device IP" screen displays when configuring the RF500S.

- This system detects that the RouteFinder's LAN Ethernet IP address is not in the same subnet as the PCs. Use RouteFinder Manager to set the RouteFinders' IP address to the same network as your PC's.

Problem #11

A message appears indicating the IP address you have inputted is either not valid on your network or is in conflict with another IP address.

- The manager has detected the IP address of the RF500S you are configuring is in conflict with another device. Power off the conflicting device and configure the RF500S using a different Ethernet LAN IP address.

RouteFinder™

Chapter 10 - Service, Warranty and Technical Support

MultiTech® Systems

Introduction

This chapter begins with the terms of your RouteFinder's warranty. In the Software User License Agreement section, you will find details about your software license agreement with Multi-Tech Systems. The Technical Support section offers information about on-line registration as well as phone numbers for contacting our Technical Support group. Also included in this chapter is information about accessing our Internet site, and information about ordering accessories for your RouteFinder.

Limited Warranty

Multi-Tech Systems, Inc., (hereafter "MTS") warrants that the RouteFinder will be free from defects in material or workmanship for a period of two years from date of purchase, or if proof of purchase is not provided, two years from date of shipment.

MTS MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

This warranty does not apply to any products which have been damaged by lightning storms, water, or power surges or which have been neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by Customer or any party without MTS's written authorization, or used in any manner inconsistent with MTS's instructions.

MTS's entire obligation under this warranty shall be limited (at MTS's option) to repair or replacement of any products which prove to be defective within the warranty period or, at MTS's option, issuance of a refund of the purchase price. Defective products must be returned by Customer to MTS's factory — transportation prepaid.

MTS WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES, AND UNDER NO CIRCUMSTANCES WILL ITS LIABILITY EXCEED THE PRICE FOR DEFECTIVE PRODUCTS.

Addendum for North American Products

In the event that service is required, products may be shipped, freight prepaid, to our Mounds View, Minnesota, factory (**Multi-Tech Systems, Inc., 2205 Woodale Drive, Mounds View, MN 55112, Attn: Repairs, Serial #**_____). A Returned Materials Authorization (RMA) is not required. Return shipping charges (surface) will be paid by MTS. Please include, inside the shipping box, a description of the problem, a return shipping address (must have street address, not P.O. Box), a telephone number, and if the product is out of warranty, a check or purchase order for repair charges.

Extended two-year overnight replacement agreements are available for selected products. Please refer to our Overnight Replacement Agreement on our web site for details on rates and coverages. Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our Technical Support department at **1-800-972-2439**.

Please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at **(800) 328-9717** or **(763) 785-3500**.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Addendum for International Products

Distributors should contact Amex, Inc., for information about the repairs for your Multi-Tech product.

Amex, Inc.
2724 Summer Street NE Minneapolis, MN 55413
U.S.A. Tel: +(612) 331-3251
Fax: +(612) 331-3180

Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our Technical Support department nearest you. When calling the U.S., please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at **+(763) 785-3500** in the U.S.A., or a nearby Multi-Tech office which is listed on the “Multi-Tech Corporate Offices” sheet in this International Distributor Resource Kit.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Out of Warranty Repair Costs

Refer to Multi-Tech System's web site at http://www.multitech.com for information about out of warranty repair costs.

Software User License Agreement

IMPORTANT - READ BEFORE OPENING THE SOFTWARE PACKAGE

This license agreement is a legal agreement between you (either an individual or a single entity) and Multi-Tech Systems, Inc. for the Multi-Tech software product enclosed, which includes computer software and may include associated media, printed materials, and “online” or electronic documentation (“SOFTWARE PRODUCT”). The SOFTWARE PRODUCT also includes any updates and supplements to the original SOFTWARE PRODUCT provided to you by Microsoft. Any software provided along with the SOFTWARE PRODUCT that is associated with a separate end-user license agreement is licensed to you under the terms of that license agreement.

By installing, copying, downloading, accessing, or otherwise using the SOFTWARE PRODUCT, you agree to be bound by the terms of this End User License Agreement (EULA). If you do not agree to the terms of this EULA, do not install or use the SOFTWARE PRODUCT; you may, however, return it to your place of purchase for a full refund.

SINGLE-USER SOFTWARE LICENSE AGREEMENT
This copy of Multi-Tech software is provided only on the condition that you, Customer, agree to the following license. READ THIS LICENSE CAREFULLY. If you do not agree to the terms contained in this license, return the packaged program UNOPENED to the place you obtained it. If you agree to the terms contained in this license, fill out the enclosed Software Registration Card, date, sign and return the card by mail. Opening the packaged program constitutes agreement to be bound by the terms and conditions of this Software License Agreement. Your right to use the software terminates automatically if you violate any part of this software license agreement.

MULTI-TECH SOFTWARE LICENSE AGREEMENT
Multi-Tech Systems, Inc. (MTS) agrees to grant and Customer agrees to accept on the following terms and conditions, a non-transferable and non-exclusive license to use the software program(s) delivered with this Agreement.

1. GRANT OF LICENSE. MTS grants Customer the right to use one copy of the software on a single computer (the Licensed System). You may not network the software or otherwise use it on more than one computer or computer terminal at the same time.

2. COPYRIGHT. The software is owned by MTS and is protected by United States copyright laws and international treaty provisions. Therefore, Customer must treat the software like any copyrighted material. Customer may install the software to a single hard disk and keep the original for backup or archival purposes. Customer shall NOT copy, or translate into any language, in whole or in part, any documentation which is provided by MTS in printed form under this Agreement.

3. OTHER RESTRICTIONS. The software may not be assigned, sublicensed, translated or otherwise transferred by Customer without prior written consent from MTS. Customer may not reverse engineer, decompile, or disassemble the software. Any updates shall be used only on the Licensed System, and shall remain subject to all other terms of this Agreement. Customer agrees not to provide or otherwise make available the software including, but not limited to documentation, programs listings, object code, or source code, in any form, to any person other than Customer and his employees and /or agents, without prior written consent from MTS. Customer acknowledges that the techniques, algorithms, and processes contained in the software are proprietary to MTS and Customer agrees not to use or disclose such information except as necessary to use the software.

   Customer shall take reasonable steps consistent with steps taken to protect its own proprietary information to prevent the unauthorized copying or use by third parties of the software or any of the other materials provided under this Agreement. Any previous version of the software must be destroyed or returned to Multi-Tech Systems, Inc. within 90 days of receipt of the software upgrade or update.

4. WARRANTY. MTS warrants that the software will perform substantially in accordance to the product specifications in effect at the time of receipt by Customer. If it fails to perform accordingly, MTS will optionally repair any defect, or replace it. This warranty is void if the failure has resulted from accident, abuse, or misapplication. A signed Software Registration Card must be on file at MTS for this warranty to be in effect.

   THE FOREGOING WARRANTY IS IN LIEU ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL MTS BE LIABLE FOR CONSEQUENTIAL DAMAGES RESULTING FROM USE OF THE LICENSED PROGRAM, WHETHER AS A RESULT OF MTS NEGLIGENCE OR NOT, EVEN IF MTS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

5. INDEMNIFICATION. MTS will indemnify and defend Customer from any claim that the software infringes on any copyright, trademark, or patent. Customer will indemnify and defend MTS against all other proceedings arising out of Customers use of the software.

6. GENERAL. If any of the provisions, or portions thereof, of this Agreement are invalid under any applicable statute or rule of law, they are to that extent deemed to be omitted.

   This is the complete and exclusive statement of the Agreement between the parties, which supersedes all proposals, oral, written and all other communications between the parties relating to the subject matter of this Agreement. This Agreement may only be amended or modified in writing, signed by authorized representatives of both parties.

   This Agreement shall be governed by the laws of the State of Minnesota.

   The waiver of one breach or default hereunder shall not constitute the waiver of any subsequent breach or default.

Technical Support

Multi-Tech provides free technical support for as long as your product remains in service. Before calling Technical Support, please read through the Troubleshooting chapter of this User Guide. Also, ensure you have completed the *Recording RouteFinder Information* section below.

To contact our Technical Support group, use one of the following contact options, keeping in mind that phone calls are handled with first priority:

Contacting Technical Support

	...Using email	...By phone
U.S. & Canada	tsupport@multitech.com	800-972-2439 or 763-785-3500
France	support@multitech.fr	+(33) 1-64 61 09 81
Germany	technical@de.multitech.com	+(49) 89028-0
China	support@multi-tech.com.cn	+(86) 10-68748015
India	support@multitechindia.com	+(91) 124-340778
U.K. & Europe	support@multitech.co.uk	+(44) 118 959 7774

Recording RouteFinder Information

Before placing a call to our Technical Support staff, record the following information about your Multi-Tech RouteFinder.

Model no.: _____

Serial no.: _____

Firmware version: _____

Software version: _____

Note the status of your RouteFinder in the space provided before calling tech support. Make certain to include screen messages, diagnostic test results, problems with a specific application, etc.

_____
_____
_____
_____
_____
_____

On-line Warranty Registration

If you have access to the World Wide Web, you can register your Multi-Tech product online at the following URL:

http://www.multitech.com/register

About the Internet

Multi-Tech System's is a commercial provider on the Internet.

The Multi-Tech web site is located at http://www.multitech.com
The Multi-Tech FTP site is located at ftp://ftp.multitech.com

Ordering Accessories

SupplyNet, Inc. can provide you with replacement transformers, cables and connectors for select Multi-Tech products. You can place an order with SupplyNet via mail, phone, fax or the Internet at:

Mail: SupplyNet, Inc.
614 Corporate Way
Valley Cottage, NY 10989

Phone: (800) 826-0279

Fax: (914) 267-2420

Email: info@thesupplynet.com

Internet: http://www.thesupplynet.com

RouteFinder™

Appendix

MultiTech® Systems

Appendix A - Regulatory Compliance Information

Class B Statement
FCC Part 15

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference that may cause undesired operation.

Warning: *Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

Industry Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique de la classe B respecte toutes les exigences du Reglement Canadien sur le materiel brouilleur.

CE

EMC and Safety Directive Compliance

The CE mark is affixed to this Multi-Tech product to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility.

and

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits:

each amended by Council Directive 93/68/EEC of 22 July 1993 on the harmonization of CE marking requirements.

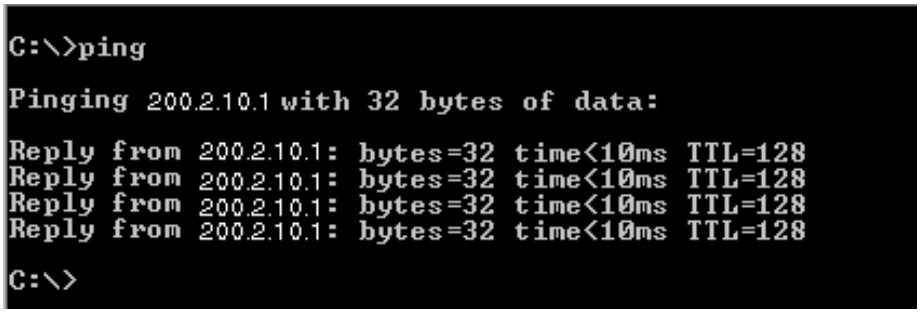
Appendix B - Tools for your RF500S

RouteFinder Monitor

If you are having problems, the RouteFinder Monitor can be a valuable tool to assist in troubleshooting. Additional troubleshooting information is available through the on-line help screens. Refer to Chapter 6 for more information about using the RouteFinder monitor.

PING

Ping is an acronym for **P**acket **I**nter**n**et **G**roper. The PING utility is used as a diagnostic tool to determine if a communication path exists between two devices on the network. The utility sends a packet to the specified address and then waits for a reply. PING is used primarily to troubleshoot Internet connections, but it can be used to test the connection between any devices using the TCP/IP protocol.


C:\>ping
Pinging 200.2.10.1 with 32 bytes of data:
Reply from 200.2.10.1: bytes=32 time<10ms TTL=128
Reply from 200.2.10.1: bytes=32 time<10ms TTL=128
Reply from 200.2.10.1: bytes=32 time<10ms TTL=128
Reply from 200.2.10.1: bytes=32 time<10ms TTL=128
C:\>

WINIPCFG and IPCONFIG

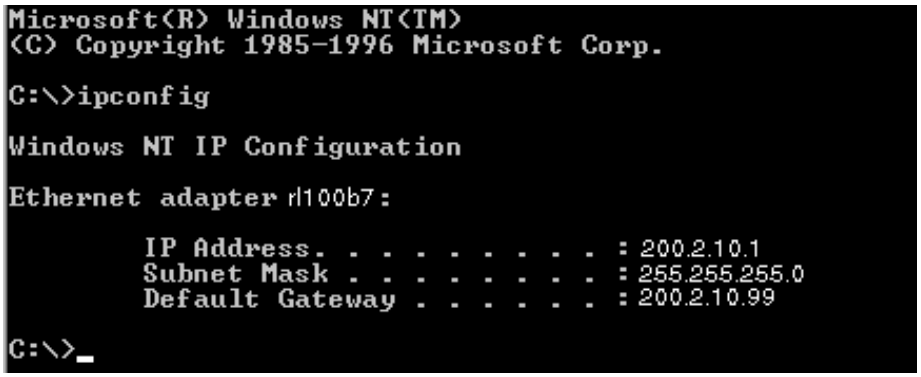
There are two tools which are helpful in finding a computer's IP configuration, MAC address and default gateway.

WINIPCFG (for Windows 95/98)

1. Select **Start** | **Run** and type **winipcfg**.
2. The IP address, default gateway (the RF500S IP address), and the MAC (adapter address) display.

IPCONFIG (for Window NT/2000)

1. From a DOS Prompt, type **IPCONFIG** and press **Enter**.
2. The IP address, default gateway (the RF500S IP address), and the MAC (adapter address) display.

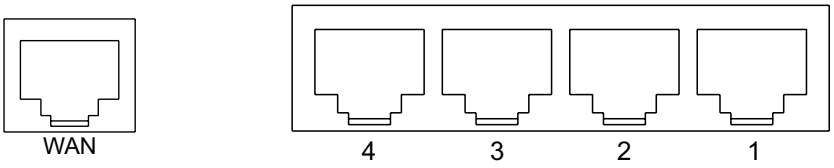

Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1996 Microsoft Corp.
C:\>ipconfig
Windows NT IP Configuration
Ethernet adapter rl100b7:
IP Address. . . . . : 200.2.10.1
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 200.2.10.99
C:\>

TRACERT

TRACERT is an extensive PING utility that allows you to trace the route of an IP address. The utility reports the number of router hops, the time for each hop, and any failed attempts to cross a hop. The information provided by this utility assists you to locate the specific site of a failed PING. You can run TRACERT at the DOS prompt (e.g., c:\tracert www.yahoo.com). The utility will provide information about the route and number of hops required to reach the destination IP address associated with the network address or URL.

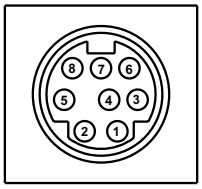
Appendix C - Cabling Diagrams

WAN/LAN Cables

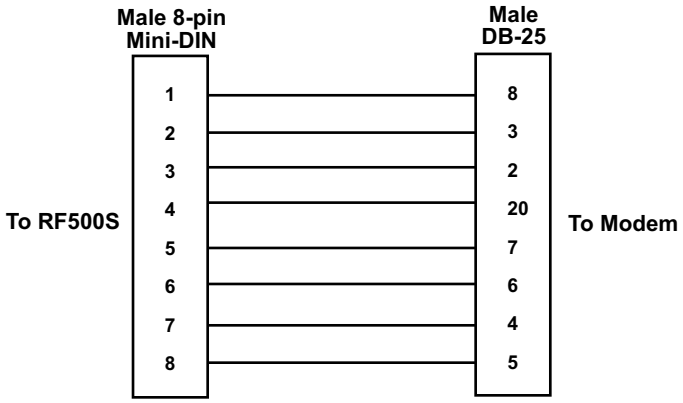


Pin	Circuit Signal Name
1	TD+ Data Transmit Positive
2	TD- Data Transmit Negative
3	RD+ Data Receive Positive
6	RD- Data Receive Negative

Serial Cable



Serial



RouteFinder™

Glossary

MultiTech® Systems

The following is a glossary of terms used in this manual:

B

Baudrate

Baudrate refers to the number of bits per second (Bps) that are transmitted between your network device and modem or ISDN TA.

D

DHCP (Dynamic Host Configuration Protocol)

A protocol that was made to lessen the administrative burden of having to manually configure TCP/IP Hosts on a network. DHCP makes it possible for every computer on a network to extract its IP information from a DHCP server instead of having to be manually configured on each network computer. The DHCP server built-in to your RouteFinder allows every computer on your network to automatically extract IP information from the RouteFinder.

Why is it called Dynamic?

Each time a network client turns on their computer your RouteFinder DHCP server will automatically give them an IP address from the IP address pool configured in the DHCP Configuration dialog box in RouteFinder Manager. It is called Dynamic because the address that is issued could be different each time a computer connects to the network.

DNS (DomainNameSystem)

A DNS Server can be thought of as the computer at your ISP whose job is to take all the URLs that you type into your web browser and translate them to their corresponding IP address. To use this the DNS translator, you need to know the IP address of your ISP's DNS Server.

E

Ethernet

A LAN (Local Area Network) protocol developed by Xerox and DEC. It is a very commonly used type of LAN.

F

Firewall

A system designed to prevent unauthorized access to or from a private network. Firewalls are typically installed to give users access to the Internet while protecting their Internal Information. Your RouteFinder uses a firewall technology known as NAT (see NAT). Each message entering or leaving the intranet passes through the firewall. The firewall examines each message and blocks those that do not meet the specified security criteria.

Firmware

Software that has been has been permanently or semi-permanently written to the RouteFinder's memory. Your RouteFinder supports flash ROM which means you can upgrade the fimware in your network device very easily by downloading a copy of the new firmware from the Multi-Tech web site and using the RouteFinder Manager Upgrade Firmware function.

FTP (File Transfer Protocol)

A protocol which allows a user on one host to access,and transfer files to and from another host over a network.

I

IP (Internet Protocol)

The Internet Protocol is the network layer for the TCP/IP Protocol Suite. It is a connectionless, best-effort packet switching protocol.

Intranet

An Intranet is the use of Internet technologies within a company. Intranets are private networks that exist only within organizations, while the Internet is a global network open to all.

IP Addresses
A computer on the Internet is identified by an IP Address. A computer's IP address is like a telephone number. It identifies one address or in this case one computing device. Every computer or device on the network must have a different IP address.

An IP address consists of four groups of numbers called **octets**, which are separated by periods. For example, 213 .0.0.1 is an IP address. An IP address consists of a **network portion** and a **host portion**. The network portion identifies the subnet that the computer belongs to. The host portion identifies the particular computer or node on that network.

IP addresses can either be dynamic (temporary) or static (permanent or fixed). A dynamic IP address is a temporary IP address that is assigned to you by a server (usually a DHCP server) when the computer is powered on. A static IP address is a permanent IP address that is set up on each individual computer. When your RouteFinder dials-up your ISP, your ISP can give it a fixed or dynamic IP address. Likewise when you power on your computer, the RF500S can give your computer a dynamic or fixed IP address.

ISDN TA
(Integrated Services Digital Network Terminal Adapter) ISDN is a high speed digital telephone connection involving the digitization of the telephone network using existing wiring. An ISDN Terminal Adapter can be thought of as an ISDN Modem.

ISP (Internet Service Provider)
An organization that provides Internet services. An ISP is the company that provides the connection from your computer to the Internet. An ISP can offer a range of services, such as dial-up accounts, e-mail, web hosting or News.

L
LAN (Local Area Network)
A data network intended to serve an area of only a few square kilometers or less. This often means a small private network in companies.

M
ML-PPP (Also called MP or MPPP)
Stands for Multilink Point to Point Protocol and is an advancement of the PPP protocol that allows for the bridging or bundling of two ISDN or analog channels for faster connections.

MAC address
The hardware address of a Device connected to a shared media. To find out the MAC address of your computer please see **Troubleshooting.**

N
NAT Technology
NAT is short for Network Address Translation. NAT is an Internet standard that enables a local-area network to use one set of IP addresses for internal traffic and a second set of IP addresses for external traffic. The RF500S provides the necessary IP address translations. NAT is sometimes referred to as "IP Address Masquerading". This technology provides a type of firewall by hiding the internal IP addresses.

How does it work?
Every IP address on the Internet is a Registered or legal IP address. Therefore, no two IP addresses on the Internet are the same. For you to use your network device to access the Internet you need a registered IP address from your ISP (Internet Service Provider). Using a registered IP address on your Intranet or LAN is not necessary. When clients on your network start surfing the Internet, your RouteFinder will receive all the requests for information. The RouteFinder will dial-up your ISP and your ISP will give your RouteFinder a registered legal IP address. Your RouteFinder uses this IP address to request information saying ,"send all information back to me at this IP address". In essence it appears as though all your clients requests are coming from that one IP address (hence the name IP masquerading). When all the information comes back through the RouteFinder, it sorts the data using an Address Translation Table and returns the data to the computer on your network that requested it.

If someone on the Internet tries to access your network, the firewall function of the RouteFinder stops the request. The device will not reverse translate network addresses unless you have specifically allowed this feature using the Virtual Server function (IP Mapping).

NetworkAddress
The network portion of an IP address. For a class A network, the network address is the first byte of the IP address. For a class B network, the network address is the first two bytes of the IP address. For a class C network, the network address is the first three bytes of the IP address. In each case, the remainder is the host address. In the Internet, assigned network addresses are globally unique.

P
Packet
A packet is a piece of a message transmitted over a packet-switching network. A packet contains the destination address of the message as well as the data. In IP networks, packets are often called datagrams.

Port Number
The term *port* can mean the connector on your computer or it can be thought of as a server number. Every service that travels over phone lines and modems has a standard port number. For example, the World Wide Web service uses the standard port number, **80** and the standard telnet port is **23**.

Port numbers are controlled and assigned by the IANA (Internet Assigned Numbers Authority). Most computers have a table in their systems containing a list of ports that have been assigned to specific services. You can alos find lists of standard port numbers on the World Wide Web.

Protocol
A formal description of message formats and the rules two computers must follow to exchange those messages. You can think of protocols like languages. If two computers or devices aren't speaking the same language to each other, they won't be able to communicate.

PPP (Point -to- Point Protocol)
PPP enables dial-up connections to the Internet and is the method that your network device connects to the Internet. PPP is more stable than the older SLIP protocol and provides error checking features.

R
Router
A device which forwards traffic between networks. If you request information from a location on your network or the Internet, the router will route the request to the appropriate destination. The router's job is to listen for requests for IP addresses that are not part of your LAN and then route them to the appropriate network which may either be the Internet or another sub-network on your LAN.

S
Server
A provider of resources (e.g.,file servers and name servers). For example your RouteFinder provides Internet Access and can be thought of as an Internet Access Server.

Subnet
A portion of a network that shares a common address component. On TCP/IP networks, subnets are defined as all devices whose IP Addresses have the same prefix. For example, all devices with IP addresses that start with 213 .0 .0 .would be part of the same subnet.

SubnetMask /IPAddressMask
Subnet mask is what is used to determine what subnet an IP address belongs to. Subnetting enables the network administrator to further divide the host part of the address into two or more subnets.

T
TCP/IP (Transmission Control Protocol/Internet Protocol)
A suite of communication protocols used to connect hosts on the Internet. Every computer that wants to communicate with another computer on the Internet must use the TCP/IP protocol to transmit and route data packets. The format of an IP address is a 32-bit numeric address written as four octets separated by periods. Each number can be zero to 255. Within an isolated network, you can assign

IP addresses at random as long as each one is unique. However, connecting a private network to the Internet requires using registered IP addresses to avoid duplication.

The four groups of numbers (octets) are used to identify a particular network and host on that network. The InterNIC assigns Internet addresses as Class A, Class B, or Class C. Class A supports 16 million hosts on each of 127 networks. Class B supports 65,000 hosts on each of 16,000 networks. Class C supports 254 hosts on each of 2 million networks. Due to the large increase in access to the Internet, new classless schemes are gradually replacing the system based on classes.

U

UDP (User Datagram Protocol)

An Internet Standard transport layer protocol. It is a connectionless protocol that adds a level of reliability and multiplexing to IP.

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